Managers Copy

Vol. III. JUNE 1919. No. 4.

THE
Madras Forest College Magazine.

MENS SANA IN CORPORE SANO

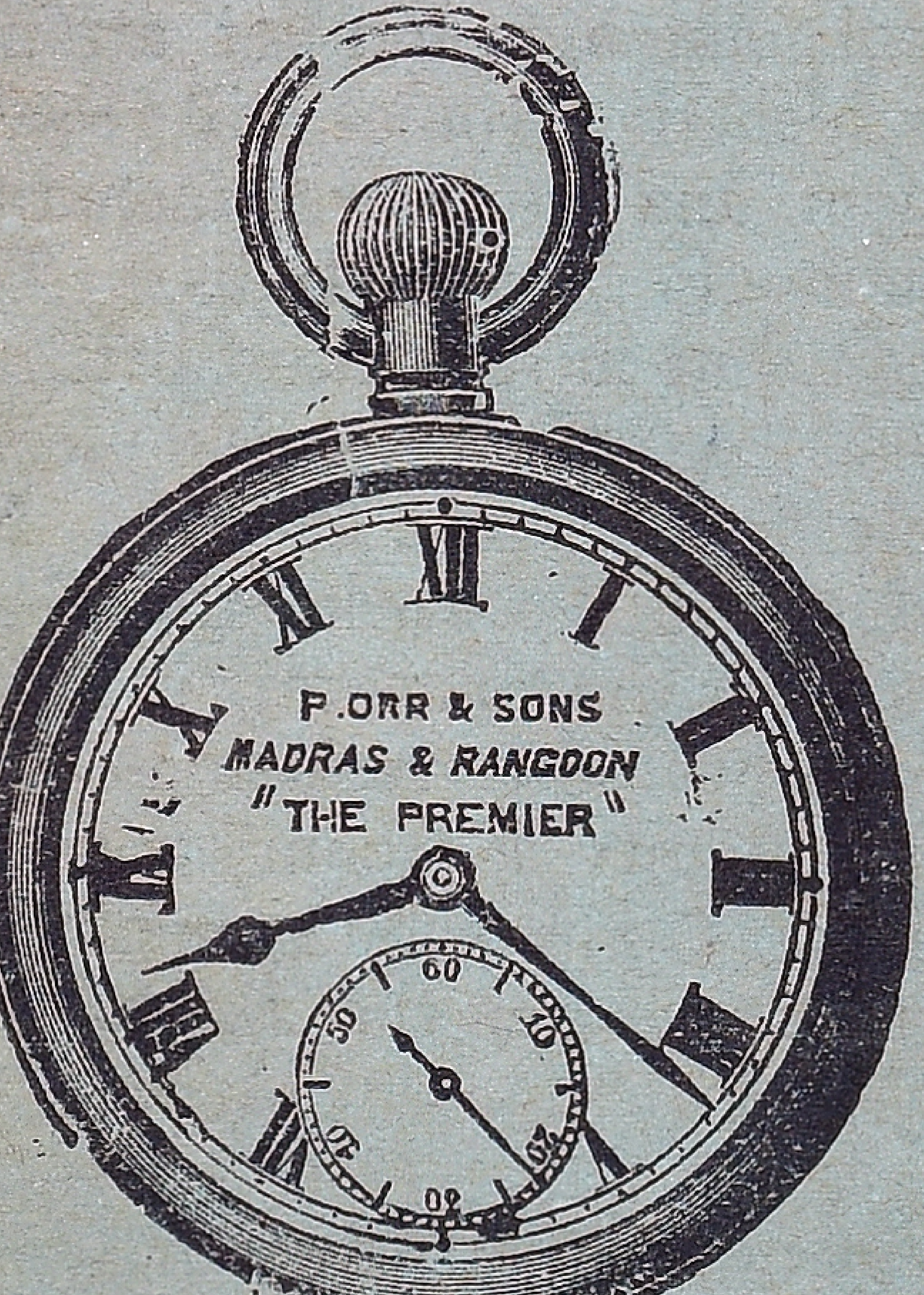
Edited at
COIMBATORE,
Madras Presidency.

Published by the Principal, Madras Forest College.

COIMBATORE.
Printed at the Electric Printing Works.

ORR'S
"PREMIER"
WATCH.

A well made and reliable Pocket Watch at a moderate price


P. ORR & SONS
MADRAS & RANGOON
"THE PREMIER"

Specification.

18 line size as illustration. Solid nickel case, crystal glass, sound lever movement jewelled in 7 holes. Stem wound and set. A really accurate time-keeper.

PRICE RS. 15

10% discount for cash or V. P. P.

P. Orr & Sons, Ltd.,

MADRAS.

St. George's Homes, Kodaikanal.

For Orphan, Destitute and Necessitous Children of British Descent.

PRESIDENT:

H. E. THE GOVERNOR OF MADRAS.

Chairman of the Board of Management:

The Hon'ble Sir Alexander Cardew, K. C. S. I.

The ultimate aim is to provide for a tithe of the 10,000 children of British Descent in India who are of school-going age, and yet are not attending any school. The area from which the Homes will receive children is from Bombay across to Ganjam and Soutwards including Ceylon. The method of training is unique in South Indis. The children do not live in one large institution, but in separate Cottages. The stamp of charity is rigourously excluded. A "Home" is the motto. The school and Cottage staffs are entirely from Great Britain- No Indian servants are permitted in the Cottage, all the work being done by the children under the supervision, and with the co-operation of the "house mother" and her assistant. A teacher also resides in each Cottage. We wish to teach the children the dignity of labour, and the indignity of unnecessary service. Technical Industrial and Agricultural training will also be included in the curriculum when the homes are transferred to their own buildings on the Nilgiris.

Rs. 35,000 are now annually required to meet recurring expenditure.

This sum must be raised from voluntary gifts in India and Great Britain.

Donations, Gifts of Clothing, Books, Furniture, Toys, etc., may be sent to

THE REV. J. BREEDEN,
Kodaikanal.

Barton Son & Co.,

BANGALORE.

Importers of Engineering, Surveying and Drawing Instruments.

Theodolites,

Levels

Clinometers.

Prismatic Compasses.

Aneroid Barometers.

Planetables.

Optical Squares.

Leveling Staves.

Land Chains and Arrows.

Measuring Tapes.

Pedometers.

Tally Registers.

Drawing Instruments.

Papers.

Colours, Etc.

Send for Complete List.

The Madras Forest College Magazine.

Vol. III. JUNE 1919. No. 4.

CONTENTS.

		PAGE.
1.	Ourselves	201
2.	Forest Management ; Ceylon	202
3.	The Marathon Race	209
4.	The Social Gathering at Sadivayal	211
5.	The Causation and Prevention of Malarial Fevers ...	212
6.	Rabis and Anti-rabid treatment	225
7.	Under Planting in Nilambur	228
8.	Memecylon edule	229
9.	A Six months' practical training	231
10.	Talk of Elephants	233
11.	Flowers that Fertilise Themselves	237
12.	Extract from The Pioneer	241
13.	A few of the lessons learnt in the Madras Forest College ...	245
14.	A brief note on Hyderabad forests	247
15.	The experience of a probationer	250
16.	A probationer's ideas about Mysore Forests	253
17.	Athletics side of the College	257
18.	Students' Club	259
19.	Occasional Notes	260
20.	Miscellanea	264
21.	Additions to the Libraries	266
22.	Contributions to the Gass Forest Museum	268
23.	Advertisement	269
24.	Gazette Notification.	272

Committee of Management.

President :—F. L. C. Cowley-Brown, Esq. I. F. S.

Business Manager :—E. M. Crothers, Esq.

Editor and Treasurer :—M. R. Ry. G. Viswanatham.

Assistant Editor :—Umapathi Mudaliar, Senior Student.

THE

Madras Forest College Magazine.

Published Quarterly.

Vol. III June 1919. No. 4.

Ourselves.

The combined camp at Sadivayal was as usual characterised by interesting events. The Marathon race—an ordeal which all the students have to undergo—over a distance of about 6½ miles of hill and plain was run on the 15th. February, a detailed account of which is published elsewhere. The winners, students V. Narayanasami Ayyar, M. B. Subbayya, C. B. Chengappa, B. S. Chengappa and A. Rama Rao, are to be congratulated, and the leader in particular as he broke the college record by finishing the race in 51′—12″, the previous record being 52′.

The social gathering held in the same camp on the 19th February was another attractive episode that tended to create and foster a communal spirit among the students, and the farce played afforded them opportunities for the display of latent talent.

* * *

We take this oppurtunity of expressing the hope that ex-students of the college will make a special effort to attend the Prize day and garden party on June 30th.

On June 29th the students propose to give a variety entertainment.

* * *

The following corrections should be made in No. 2 of Vol III.

On page 95 read *1000 oz.* instead of 100 oz against the weight of 1 c. ft. of water.

On page 96 read *32·1 tons.* instead of 325 tons as equivalent to 7200 galls.

On page 99, last line, read '*two* goals to one' instead of '*four* goals to one'.

We regret that in the March issue of the Magazine the author's name (Mr. F. J. Marshall) of the article on "The opening of the Alangayam—Komattiyeri Road" was not acknowledged. The articles on the Punjab Forest Department and on water Hyacinth were taken from the '*Pioneer*'.

* * *

Mr. K. Ramasami Ayyar a retired trained ranger has been appointed overseer of the College Estate on Rs. 50.

* * *

Forest Management; Ceylon.

Though I have chosen this as the subject of my talk, I do not mean to deceive myself or others with the idea that all I say here is the sum total of the administration of the Forests of Ceylon; nor do I pretend to have a full knowledge of the Forest Department in all its branches of life and in different parts of the Colony.

It would rather amount to nought were I to begin a history of the Forests from the Portugese and Dutch eras, suffice it here to say that time or that evolution in nature acting harmoniously with the excellent climatic and soil conditions of the Island has reserved for us virgin high forests with plentitude of vegetation and valuable produce as good as those found in the Madras Presidency.

Ceylon awoke to the necessity of Forest Conservancy long after Madras and that does little prevent us from making the best for the time lost, in the future. We now stand a semi-government Dept. with one conservator as the head of the Dept. 2 Deputy conservators, 10 Asst. conservators, 8 Foresters (who are also subdivisional officers), about 60 Rangers and a few hundred guards and watchers. The subordinate staff is given quarters and no uniforms and those are considered privileges. The guards are of better mould than those found here; a shade more honest, majority of them educated, knowing to read and write English to an extent of usefulness and are of wealthy people in their own way. This last quality haply acts as a good cure against bribery, underhand dealings and corruption—not to speak of 'mamuls' the practice of which I am glad to say is not current in Ceylon. There is no grade to correspond to the Forester of the Presidency. In heavy Ranges an additional Ranger is often allowed. This corresponds in office to the Dy. Ranger of Madras.

The staff receive comparative salaries with annual increment according to their grade, position and service but in all cases the scales are much lower than the salaries of the superior staff officers of the Presidency. Our guards are however better paid. They start from 15-30 and watchers from 10—15.

The Forest charges of the administrative executive and protective officers are the same as those of the Presidency.

Now for something about the Forests. Ceylon has a very evenly distributed rainfall and this with other favourable local conditions largely account for the absence of fires in our Forest. They are mostly semi-evergreen Forests with the ground always thick with moist litter and humus and a full canopy. I have never yet heard of any Forest fires in Ceylon nor of any fire protective measures adopted. I believe there are none. To make things clear let me say that Ceylon has a country division, the central protion covering the hills is known as *'up-country'* and the plains as *'low-country'*. The latter is warmer having a maximum temperature of 98° rarely going up to 99° and upcountry an avarage of 85° *Nuwara Eliya* is the health resort of Ceylon at an altitude of 6020′ and is much colder than Ooty. These hill stations especially those at higher altitudes have poor forests. Exotics such as those found in Ooty are grown in Estates and gardens. The Forests near the towns had been ruined by fellings for town and Estate fuel. Foreseeing the danger of a fuel shortage and the probability of the destruction of the Forests interfering with the rainfall of the Island, Government constituted a a Reserve of all these Forests and also ruled that no land over an elevation of 4000′ should be sold. Thus every acre outside the Reserve was clearfelled and is now either a plantation of tea, coffee, Rubber cocoa or cardamam, each Estate having its own factory; as was inevitable, the fuel from private lands was soon consumed and the Dept. has since the supply of fuel in the central provinces; a system of reafforestation is carried out. Long narrow strips of Forests suitably chosen and protected by wind-belts, are demarcated annually, clear felled and sown in patches with seeds of either Acacia decurrens or A. melanoxylon as fast fuel-producers. The fellings are done by contract at a certain fixed rate per cubic yard (all fuel reckoning is by the cubic yard) approved on tender to fell and cart the produce to the Government fuel Depot; at the completion of the fellings payment will be made to the contractor according to the quantity extracted. Extraction of the fuel to cart-tracks is almost always by wire-shoots. Great quantities of fuel are also supplied to the Ceylon Government Railway from suitable forests, and delivered at sidings directly by wire shoots; Reafforestation was here deemed a a success and the contract system as explained above was not a failure. But the staff for supervision of work all over the Province was short and hence the fuel supply to Estates took a more serious turn. The demands were great and the staff inadequate to work the demand. The Government therefore apportioned out Forest areas to each estate on condition that they handed back the lands fully stocked with seedlings of Acacias after the fuel had been extracted. In short the estate had to fell the trees, fence and sow up the areas given to them as a return for the estimated value of the produce given to them at a rate of concession. This is exactly what is being done and is a saving of the labour difficulty.

The supply of Railway sleepers from the Forests of the Northern, North central and Sabragammva Provinces both departmentally and by contract is immense. Chloroxylon Swietenia (Satin wood) formed the principal and best sleeper wood. The importance of this wood from a commercial point of view has greatly lessened the supply to the Railway; now other woods such as Berrya Ammonilia (Trinco wood), Vitex altissima, Mimusops hexandra, Terminalia glabra, Persea semicarpifolia and Bassia longifolia are largely used.

Large quantities of timber are sent to the 'central Timber Depot,' Colombo from all parts of the island. The most valuable are Diospyros

Ebenum (Ebony) and Chloroxylon swietenia (Satinwood) which are commercially equivalant in value to the sandal and Rosewood of India. These are put in the market and exported to Eupore.

Plantations of Teak, Artocarpus integrifolia (Jack) and Pericopsis Mooniana exist and are maintained in the northern and western Provinces but about these I am unable to give much information. Large plantations of Teak are now being started in the Eastern Province.

The extraction of timber is unlimited in the low country; all the largest girth classes have been and are being felled. The extraction or working of the forest is as far as I know not restricted by any system or method of working. The marking officer generally the Ranger is to select and hammar-mark trees and this he does according to what he thinks as sylvicultural. The pure high forests, the excellent growth and abundance of large sized timber has apparently bulked largely in the eyes of previous exploiters and the Permit system is having its sway. I hope it will not be long ere the permit system is abolished.

A FEW SUGGESTIONS :—

The first is that the present pocket tapes and chains should be replaced by steel tapes. We measure and remeasure many sample plots annually and periodically with metallic tapes. How long these tapes keep good is easily said from the present condition of the tapes in use and what amount of accuracy is arrived at our experience alone can tell; chains are similarly used for measuring and in survey and they give no better results; they stretch as badly as cloth tapes and have to be checked before every day's work. Why not improve these unsatisfactory conditions by using steel *tapes ? They are strong not capable of either shortening or lengthening, durable, as easily handled as the ordinary metallic

---

*[We understand that steel tapes have been ordered for the College.—Editor]

tapes and above all they give very accurate measurements. They are obtainable in chain lengths as also in smaller lengths. Those used in Ceylon for measuring trees of Sample plot are of 9′ lengths. Rolled up it is about the size of the 8′ tapes sold in the college stores. It would be of immense value if these pocket steel tapes were introduced in the college as then the students will not any more be troubled with that puzzle of indicision so often met with in the field as to which has put on the 'current annual increment' the tree or the tape? To think that the former has grown less in size or the latter longer in length is equally surprising if not absurd. Would not a pocket steel tape decide this?

One more thing before I finish. Let me allude to another hope, an improvement to the life-saving factor of Malabar, the suicidal boat. How many of us like Malabar, its waters, and its surroundings, yet how many other othan Malabarians flinch to cross one of its rivers in those boats where even the most ungodly force themselves on God's mercies with low murmur of invocations. The boats have no seats to make one comfortable and worse still they are unstable even in still-water. To be candid, one has to squat down into it, first fix his centre of gravity and maintain an equilibrium; a single motion of the hand to scratch his nose makes one wear his heart in his sleeve and the boat threatens to rock him from the cradle to the deep. It is appalling to shift the destined man's formal burial to a watery grave; and if saying is true to phantasmagoria, that all the past deeds good and bad of a drowning man is visioned out to his eye just where his spirit or Soul which ever it is, whispers a hurried good-bye to his body, how many of us would prefer to die on land, gladly forgetting all the evil deeds of his past, and passing away not in the drowning man's '*Karma*' but in peacefulness, the comfort of a doctor and a home. This hazard to life did not escape the keen foresight of our Principal, and as a measure to combat it, he made swimming one of the qualifications for every student of the college. It was not an optional subject neither was it a compulsory one, neverthless he made every student swim. Let me now try a little logic, say, 'Cause and Effect' : something causes the boat to rock and the overturning is the effect of that cause; swimming is the remedy against the effect or effectant result, drowning. Why not remedy the cause and the rest would be a reserve. It is easy enough. It is done in Ceylon as is always safe, as dry land. I mean the fixing of an 'out-trigger'* It can be tied on to the present boat of Malabar with 3 pieces of small, light, round timber, two with a slight curve and one straight. One end of one bent pole tied to the front of the boat and across it with the bent end just touching the water and to the right of the boat a similar piece tied about ⅔ down the length of the boat; the 3rd piece allowed to float in the water and tied to the two projecting ends; the lengths of these pieces of round timber may be ⅔ the length of the boat. This done the boat is rendered quite stable and rarely or never overturned. Planks can be nailed on across the boat at convenient distances according to the number of persons the boat is capable of carrying. This construction in tamil is known as the 'Kolla' in Ceylon. The boats thus secure perfect comfort and insurance. I have known these boats in Ceylon brave the the roughest lake and breast the more boisterous waves of the sea. How much more then, would it not do in a river?

COIMBATORE, }
10—3—19. }

E. S. W.

*[An excellent idea if the conservative Malayali could be persuaded to adopt it.
Editor.]

[We welcome our contributor's description of Forest conditions in Ceylon and we should be glad if Hyderabad, Coorg, etc. students would similarly enlighten us as to Forest life in those provinces.] EDITOR.

The Marathon Race.

The annual Marathon Race was run along the usual course of 6 miles 5 furlongs and 100 feet during the combined camp (of both Seniors and Juniors) at Sadivayal on 15—2—19. The start was given by the Principal at the College camp at 7. 10. A. M.

From the very beginning C. B. Chengappa and V. Narayanaswami Ayyar were together, closely followed by M. B. Subbiah, B. S. Chengappa and Narayana Rao. It was at first, impossible to tell who would win the cup. But while getting down the stiff hill from the first obligatory point C. B. Chengappa had to fall back a little owing to a mishap and M. B Subbiah went in advance of him, V. Narayanaswami Ayyar leading. C. L. Narayana Rao senior student was among the 1st five till he came to the point at which the road turns to the compartment line leading to the second obligatory point, when he missed the point and proceeded along the road to a good distance. He found out his mistake after a time and retraced his steps to the turning. It was thus very unfortunate for him to have lost his place and he had to come fourteenth. The winners of the race in the order of merit are V. Narayanasawmi Ayyar, M. B. Subbiah, C. B. Chengappa, B. S. Chengappa and A Rama Rao.

From the very start most of the juniors acquitted themselves well, owing to the good practice they had previously and they won the Inter-divisional cup which was so kindly presented by the late Rissaldar Major Amir Mohammed Khan Bahadur, whose death which occurred lately, we deplore very much.

The Principal with his wonted paternal kindness towards the students supplied them with cold drinks which was very much enjoyed and felt grateful for by the students after the hard run.

The principal then delivered a short speech. He felt very glad and congratulated V. Narayanaswami Ayyar for having beat the record of the College in this race. He appreciated the general finish of the race as a whole and said that it was as good as ever. This year the first winner was not given a medal but a cup. He expressed his opinion—very aptly—that medals are more for the military men who win glory at the mouth of the Cannon, and it is more fitting for them if they wear the Medal on their breasts. The best of the races in England, the Oxford Boat race is much competed by great men not for the Medal (for no medals are given) but for the honour. The Marathon race itself was first instituted in Greece and no medals were given but the winner carried honour and glory with him. He expressed his regret that the Instructors posted at the two obligatory points had no chance of witnessing the winners reaching the goal. But it could not be helped for no better course could be selected.

He then called upon Mrs. Crothers to distribute the cups. She gave away the cups very kindly amidst loud cheers. The pleasant meeting then came to a close with cheers to Mr. Dawson who coached the Juniors to win the Marathon Race.

The Range officer Mr. A. P. Sreenivasa Iyengar, very kindly gave tea to all the students which refreshed them much and he was highly thanked for it.

The times of the 1st five winners are :—

1.	V. Narayanasawmi Ayyar	51′ 12″
2.	M. B. Subbiah	53′ 10″
3.	C. B. Chengappa	56′ 15″
4.	B. S. Chengappa	56′ 25″
5.	A. Rama Rao	57′ 0″

A comparative statement of the times of the winners of the Marathon Race during the past 4 years is given below :—

1919.	V. Narayanasawmi Ayyar ...	51′ 12″
1918.	P. K. Parameswaram Pillai ...	54′ 45″
1917.	C. S. Nanjappa	52′ 0″
1916.	C. S. Nanjappa	56′ 15″

The Juniors won the Divisional cup by 78 marks against 141 of the Seniors. It is interesting to note that the present seniors won the cup last year against their seniors.

Although none were absent for the race, two students could not complete the course.

M. Umapati.

The Social Gathering at Sadivayal.

The combined camp at Sadivayal is a great blessing to the students for developing mutual sympathies both among themselves and with the Instructors. All live closer together than at other camps and understand each other much better. The social Gathering was one of the chief events at this camp. During the previous years, it used to be held during the latter part of February after the Principal left the camp. But this year we have departed from that rule and celebrated it on 19—2—19 when the Principal was still at Sadivayal. He was requested to take the chair to which he very kindly consented. The presence of Mrs. Cowley-Brown was an additional source of pleasure to the Students. Mrs. Crothers and her family and the Instructors were all invited to which they readily responded and gave the Students much joy. The guests were entertained with songs, both English and native, humorous recitations and a pretty little farce. The singers were Jurianz, Muliyil and Subba Rao. The humorous recitation of Sheshagiri Rao amused the audience to a great extent. Lastly after the guests partook a little of tea, Jurianz and his Company, other members being Abdul Rahiman and the "little Maiden" Rama Rao, acted the farce and entertained the guests with their wits.

The Principal, on behalf of the other guests thanked the Students very much for the entertainment they gave them and said that they were all immensely pleased with it. He further said that the gathering gave a clue as to what the students are capable of in the way of reciting and acting and that there was still a vast field among them if gradually explored. The happy function ended with enthusiastic cheers to the Principal and with "God Save the King."

M. Umapati.

The Causation and Prevention of Malarial Fevers.

The most common and dreadful diseases one suffers in a Camp are the Malarial Fevers.

In the following statement I shall endeavour to describe as clearly as possible the cause of Malarial Fevers, the method by which they are contracted, their chief symptoms, treatment, and the means by which they may be prevented.

This statement will perhaps be useful to students and officials of the Forest Department, whose life is mostly spent in unhealthy camps, situated mostly in dense forest, where medical aid is not *readily* procurable.

The cause of malarial fevers.

In the year 1890 Laveran a French Army Doctor discovered that Malarial fevers are caused by the presence of a large number of Micro, organisms in the blood of patients suffering from the disease. These micro-organisms which live inside the blood corpuscles are small animals belonging to a grade of the animal Kingdom called the Protozoa which name is applied to the lowest grade of the animal Kingdom and these micro-organisms are called the Malaria parasites, which are the chief cause of malarial fevers.

The animals in which a parasite passes its life, and at whose expense it lives, are called its hosts, and the hosts of the Malaria parasite are man and mosquitoes In man the organism is found in the red blood Corpuscles and in the mosquito in the tissues of the stomach wall and in the salivary glands.

These malaria parasites multiply themselves by two methods. Firstly by an asexual method, consisting of the simple division of a parasite, after it has grown to a certain size, into a number of small parts each of which can enter a new corpuscle and become a young parasite, exactly similar to the original one; and secondly by a sexual method, consisting of the union of two cells, which have acquired different properties (male and female), and the resulting fertilized cells, grow and divide themselves into a number of parts which are capable of becoming young parasites, exactly similar to the original ones. But as a general rule all the parasites at the commencement of their life multiply themselves only by the asexual method, and that after a certain number of generations have been thus produced sexual forms appear, which are capable under suitable conditions of carrying on multiplication by the sexual method. Without sexual reproduction the organism would after a certain number of asexual generations become worn out and die. Man is only the entermediate host of the Malaria parasite, because in his blood only asexual multiplication by cell division of the parasite occurs, and if the organism had no other method of multiplying itself than this, it would die out with the death of the man.

The mosquito is the definitive host, because in its body sexual multiplication, by which the parasite is enabled to start its life afresh whatever may afterwards happen to the mosquito, takes place.

A young parasite when seen under the microscope will appear to be, as a small unicellular mass of protoplasm, manifesting amaeboid movement and occupying but a small portion of the whole corpuscle It gradually grows larger, feeding upon the substance of the red blood corpuscle and converting the haemoglobin into dark granules of pigment, which may be plainly seen in the parasite. When it has grown to its full size, so that it nearly or quite fills the corpuscle, the grains of pigment collect together into a mass and the parasite begins to divide up into a number of small parts, each of which is capable of becoming a new parasite identical in all respects with the original one. These parts or segments called "spores" remain in contact with each other for a short time, and then burst through the red blood corpuscle and become free in the blood. Each of them now seeks out and enters a fresh red blood corpuscle in which it begins to grow in the same way as the original one did, ultimately reaching its full size and dividing up into a fresh number of embryo parasites which again enter other corpuscles and go through the same cycle. This is the asexual method of multiplication, and it is clear that even if originally only one corpuscle contained a parasite, a very large number of corpuscles will, by this method, soon become infected.

After this method of multiplication has gone on for a certain number of days, some of the parasites in the red blood cells instead of going on to their full size and dividing up into a number of segments, proceed to the formation of sexual forms, composed of Male and Female forms. Having attained to their full size they appear as coarsely pigmented round or crescent shaped bodies enclosed within the thin shell or envelope of the red blood corpucle. In the blood of man they under-go no further developement. If, however a mosquito bites a man with these sexual forms in his blood, some of them are carried into the mosquito's stomach with the blood which the insect extracts. If the Mosquito is of the *Anopheles* genus, further development of the parasites in its stomach occurs, and thence they are conveyed by the circulation to the salivary glands, and penetrating the outer wall of the gland cells they come to rest in them and in the salivary duct which has its external opening at the point of one of the piercing stylets of the proboscis which enter the skin in the act of biting. When the mosquito next bites a man it injects some of these parasites into his blood with the salivary fluid- Having got into the blood of man again, the sporozoites after a certain time are found in the red blood corpuscles, as young parasites identical in all respects with those forms in which the cycle was commenced.

The Method by which Malarial Fevers are contracted.

A mosquito of the *Anopheles* genus bites a man who has been suffering for some days from malarial fever, and who has sexual forms of the parasite in his blood. These sexual forms are taken into the mosquito's stomach with the blood which it sucks in, and there they undergo the development that I have just described, resulting after some days in the formation of numerous sporozoites which lodge themselves in the Salivary or poison gland of the mosquito. When, this mosquito next bites a healthy man, it injects some of these sporozoites into his blood with the salivary fluid and so produces a malarial infection in him similar to that of the man from whom it originally sucked blood. It has been proved almost beyond any possible doubt, that there is no other method by which malarial fevers can be contracted than by the bite of a properly infected *Anopheles* mosquito. We cannot contract malarial fevers from drinking impure water, or from the soil, or by breathing impure air, and water and air are only indirectly connected with malarial infection, in the sense that they are the homes of the malaria carrying mosquitoes.

The general characters of Mosquitoes.

The general appearance of a mosquito is probably well known to all. It has a long sucking apparatus called the proboscis. The wings of a mosquito are covered with scales which can be plainly seen with a small magnifying glass.

The different stages through which Mosquitoes pass before they reach the adult state:— An adult female mosquito lays its eggs on a pool or other collection of water. In a few hours, these eggs hatch into small animals, called larvœ, whose life is spent entirely in water. After a varible time, depending chiefly on the temperature, the larvœ change their shape and character, and become small comma-shaped creatures called *pupœ* which spend their time struggling to the bottom of the water and floating up to the surface again to breath; After one or two days the *pupœ* are transformed into the adult insect or *imago*, which emerges at the surface of the water. After resting for a while on the surface of the water, the adult mosquito flies away to seek its food from the blood of some animal or man. The appearances of the various kinds of mosquitœs differ in all these stages of the insects' existence, and it is important to know these differences in order that we may be able to distinguish the Malaria-bearing from the harmless mosquitœs. There are different species of mosquitœs but for the present purpose, it is only necessary to have a knowledge of two species (1) The *Culex* genus and (2) *Anopheles* genus.

The difference between *Culex* and *Anopheles*:—The eggs of *Culex* genus of mosquitoes are laid on water in small black masses consisting of several hundred eggs joined together like rafts. These egg rafts look like a small lump of soot floating on the surface. They can be seen on almost any tin or tub of stagment water that has been left lying about out of doors.

The eggs of *Anopheles* genus of mosquitoes are tiny rod shaped bodies which as each egg is laid separately can only be seen plainly with the aid of a lens.

The Larvœ of *Culex* are a number of small active creatures about 1/16 to 1/4 of an inch long, which wriggle about in the water, now diving to the bottom and then coming up to the surface to breathe, which they do by means of an air-tube attached near the tail. When they come to the surface to breathe, they hang obliquely with their head downwards and with only the tips of their air-tubes at the surface of the water.

The Larvœ of *Anopheles*, have no external air-tube and the result of this is, that they lie flat at the surface of the water. They move along at the surface when disturbed in backward direction by a series of darting, jerky movements.

The pupæ of Culex — The pupœ are small comma shaped creatures bearing no resemblance to the Larvœ, and they breathe by means of two trumpet-shaped projections attached to the head, so that they lie with their heads at the surface and their tail downwards.

The trumpet-shaped breathing tubes of the *pupœ* of *Culex* are longer and more slender than those of the *Anopheles* genus.

The difference between a Male and a Female Adult Mosquito: In the male variety, you have a feather-like tuft in front of the head which is called the Antennae, in female mosquitoes the Antennae have no long hairs and are nearly bare. Again in females very often the abdomen is distended with eggs or the stomach may be full of blood, whereas the male doesn't bite and hence the stomach will be empty.

The difference between the Adult Culex and Anopheles Mosquitoes: In *Anopheles* the palpi are long while the *Culex* have short palpi. The attitude of *Anopheles* when resting on a wall or roof is, that it keeps its head, neck and abdomen in one line and the hinder part of its body projects outwards from the wall, so that the insect frequently appears to be standing on the tip of its piercing apparatus or proboscis, while with *Culex* the body is either kept parallel or the tail end is even nearer to the wall than the front part of the body, so that *Culex* appears hunch-backed. *Anopheles* have spotted wings, while *Culex* have plain and uniformly coloured wings.

The Characteristics of Malarial Fevers :— It is well known that the most prominent symptom caused by an infection with Malarial parasites is fever of a very definite and peculiar character, which may be termed Intermittency and Periodicity. By Intermittency is meant the fact that the fever ceases at intervals; the temperature alternately falls to normal or below, and rises again. This is called Intermittent Fever.

By Periodicity is meant the habitual tendency of the fever to recur at stated intervals of time. Thus the fever may recur at intervals of 24 hours called the Quotidian type or at intervals of 48 hours, called the Tertian type, or at intervals of 72 hours, called the Quartan type — all cases of fever due to presence of malarial parasite in the blood will if left untreated, sooner or later exhibit these two characteristics of Intermittency, and Periodicity.

It has been already described how the parasites in the red blood corpuscles gradually grow larger and larger until they attain, their full size and divide up into a number of segments which burst through the thin remnant of the corpuscle and become free in the blood ready to enter fresh corpuscles. It has been found that the onset of the attacks of fever from which the patient suffers always corresponds in point of with the stage of segmentation of the parasites. During the interval of fever only young and medium-sized parasites are found in the red blood corpuscles and it is only when the parasites are in the segmenting stage and escaping from the corpuscles that the attack of fever begins.

There is thus a very intimate connection between the segmentation of the parasite and the attack of fever, and it is probable that during the growth of the parasite, in the red blood cell it produces a pyrogenetic or fever producing chemical substance, which when the parasite bursts from the red cell, in the act of segmentation is liberated into the blood and so becomes able to exert its influence and cause fever.

From the above it will be seen that a parasite which segments every 24 hours, will produce Quotidan fever, one which segments every 48 hours will produce Tertian fever, and one which segments every 72 hours will produce Quartan fever. There are three varieties of malarial parasite which segment at the above intervals, and they are respectively called :—

(1) The Malignant Tertian parasite

(2) The Benign Tertian parasite

(3) The Quartan parasite.

I shall describe first the result of an infection with Benign Tertian parasite, because this is the type most commonly met with in India; Supposing a man to have been bitten by a mosquito infected with the Benign Tertian parasite, he will probably not feel any ill effects until about 12 or 14 days afterwards. This is the incubation period during which the parasites have been gradually multiplying in his blood but have not been present in sufficient numbers to cause any symptoms. Towards the end of this period he may feel some aching of the bones, headache, or other premonitory symptoms, and his temperature may be somewhat raised. After these indefinite symptoms have gone on for a day or two the regular attacks of "Ague" begin. These consist of a series of attacks of fever which recur, in infections with the simple or Benign Tertian parasite at definite intervals of 48 hours. Each attack is represented by a cold, hot, and a sweating stage. At the beginning of cold stage the patient feels chilly; after a short time the feeling of cold spreads all over his body, and becomes so intense that his teeth chatter and he shakes from head to foot. His temperature, however, in spite of the feeling of cold begins to rise. After a time the shivering stops and the patient begins to feel hot, the skin becomes dry, and burning, and the temperature rapidly rises to 103° F or 104° F or more. After an hour or so the hot stage passes off, the patient begins to perspire profusely, the fever quickly declines, and in a short time all the acute symptoms have disappeared and the patient feels almost well. As a rule he is able to get up and go about his occupation, until the next day but one, when he will again have another attack of fever similar to the first one. If untreated the attacks may recur every other day for many weeks, gradually declining in severity as time goes on. In the meantime the patient's spleen has become enlarged and he has become pale, and anæmic. After the fever has apparently left him for good it may return at irregular intervals for many months (Relapses). The relapses of fever may be brought on by almost any exciting cause, such as chill, over-fatigue, over anxiety, exposure to sun etc., and have no connection whatever with mosquitoes. They are simply due to the fact that all the parasites of the first infection have not died out, and when the patients resisting power is lessened by any of the exciting causes just mentioned, the parasites are able to develop rapidly again and produce their ill-effects.

Quarton infection :— The symptoms produced by an infection with the Quarton form of the Malaria parasite are similar to those produced by the simple Tertian form except that the interval between the onset of the attacks of fever is one of 72 hours instead of 48 hours. The reason of this is that the Quartan parasite takes 72 hours to complete its asexual cycle instead of only 48 hours, as is the case with the Tertian parasite.

The after effects of Malarial infection :— After a succession of attacks of untreated or insufficiently treated malarial fever, a patient develops the condition called Malarial Cachexia. The chief signs of this condition are marked anæmia, great enlargement of the spleen and sometimes of the liver, a sallow earthy complexion of the skin a tendency to swelling of dependent parts and the presence of chronic irregular low fever ranging from 99° F to 101° F or more for many weeks or months; As a rule, no malarial parasites can be found in the blood of these patients and for this reason they are not amenable to quinine. The chronic low fever from which they suffer is due to the secondary result of their general condition.

The treatment of Malarial Fevers:— Quinine is the only reliable drug in Malarial fevers, and if given in a proper manner and in sufficient doses it seldom fails to effect a cure. If quinine is given in small doses at the beginning of an attack of malarial fever, it may continue in an irregular manner in spite of the usual doses of quinine.

As soon as a man gets Malarial fever it is best to begin the treatment with quinine at once, irrespective of the stage of the fever and to keep the patient slightly cinchonised, (*i. e.* until buzzing noises in the ears and deafness exhibits) by repeated doses of the drug until he is cured.

Quinine acts most effectively on the parasite when it has escaped from the red blood corpuscles in the act of segmentation; As we have already stated that this corresponds in point of time with the onset of the paroxysm (the cold stage), and whatever other doses of quinine is taken by the patient during the day, we should always make sure that he takes one large dose (say of 20 grains) shortly before his paroxysm is expected. One dose taken at this time will, in the ordinary regular Tertian and Quartan fevers, probably stop all future paroxyms.

Quinine which is tasteless, is quite as effective as ordinary quinine and can be easily given to children. It must be given in the shape of the powder, otherwise if dissolved in acid, its bitter taste returns.

Quinine is much more effective, if given hyphdermically. Tabloids of the bi-hydrochlorate or some other soluble salt should be used dissolved in distilled water, but as this requires great care to thoroughly boil the needle, syringe, and solution, and to render the skin thoroughly aseptic before carrying out the operation. The aid of a medical man is essentially necessary. As in syphilis, continuous treatment is necessary for some months after all symptoms have passed off to ensure freedom from relapses.

Prophylaxis.

Under this heading we must consider 1st how to prevent malarial fevers. and 2nd how to extirpate malarial fevers. These consist of :—

(1). The extermination of Anopheles Mosquitoes.

(2) The protect on of every one from thh bites of Anopheles Mosquitoes.

(3) The use of prophylactic drugs. The extermination of Anopheles Mosquitoes is much more easily dealt with in their larval condition in water than in their Adult state, by getting rid of all places where they can breed.

This is done by draining away large areas of water, and filling in of all small tanks and pools and the removal of stagnant water wherever it may be. Any superfluous water which cannot be drained away may be made an impossible breeding place for Anopheles, by covering it with a layer of Kerosine Oil, which not only kills all larvae but also any adult mosquitoes that may come to lay their eggs on the water.

The plan of attempting to protect every one from the bites of infected Mosquitoes is by covering in the doors and windows of houses and beds with mosquito-proof netting; and to protect the the whole body from mosquito bites, while going out in the evening or sitting in the house or verandah by wearing sfficient clothing. The use of prophylactic drugs consist of taking a dose 15 grs. of quinine combined with 2 drams of magnesia sulphus for two successive days and repeated at intervals of 8 days throughout the period of 3 months.

If during the course of the treatment the individual gets a relapse of fever, he should take 5 consecutive days' treatment with quinine given as follows; on each of 1st and 2nd day 30 grs. of Quinine *i. e.*, 15 grs. in the morning and 15 grs. in the evening and on each of the 3rd, 4th, and 5th days 15 grs. of Quinine. The after treatment is then continued in the same way as before, *viz.*, 15 grs. on two successive days; every 8th day for 3 months small doses of Quinine 3 to 5 grs. combined with Arsenic may be taken daily to prevent relapses.

J. E. D'CRUZ,
Medical Officer,
Senior Divison,
Madras Forest College.

Rabies and Anti-rabid treatment.

The greatest of imaginable problems on the face of the earth is well-known to be the struggle for existence. This is common to all things human including man. His is too delicate a machine to stand any slight careless handling which causes permanent or temporary derangement. He is put to suffering to a greater or less extent as the nature of the case may be, has to gradually lose his game in life, and ultimately has to cease to live for ever. Many are the diseases he is subject to and of these, rabidness is one of the worst and most deadly. Unlike many poisonous bites whose signs of bad development are immediate, the development of the rabies takes a comparatively long time to put the human system out of order, ultimately involving the patients in the greatest imaginable sufferrings to end in irremediable death.

The thought of the serious nature of the disease and the attendant horror have called upon the energies of scientific heads to arrive at the means for a very effectual treatment. Nothing curative has yet been found and preventatives are only very few. Experiments are continously being made to hit at the farmer which yet is said to remain a mystery. It is far beyond the pale of the writer's little knowledge to dwell even shortly upon the different scientific means adopted to secure the preventatives. To be brief, the Pasteur system of injecting attenuated poison sub-cutaneously to persons bitten before the disease shows any visible sign of development has till now been found the most *favourable.* The doctors in our immediate neighbourhood counsel us to take to immediate caustic treatment of the wound which they say is eminently desirable, pure carbolic acid furnishing the most effective cautery. The appliance of the caustic is said to have an easy way for the success of the preventative treatment; so much for the learning of the West. Attempts are not wanting in the native quacks, to secure preventatives.

This is the one in vogue at Malabar and of which the writer has practical experience. As soon as the bite is over, warm water, made warm by pouring cold water over the smouldering embers of a burnt fuel, is applied to the surface of the wound. Also the bitter juice of tender *Memordica Charantia* (Tamil *Pagal*) is applied to the surface of the wound. These two perhaps take the place of the caustic in preventing the injected poison from gaining early and effective admission into our delicate system. The earliest possible opportunity is availed in getting what is known as 'Kopam oil' a medicinal one procurable at a country place. Early in the first morning the patient is asked to drink half a measure of the oil and another half a measure is smeared all over his body. He is not to touch the ground, nor to taste anything. He is to keep a complete fast till the end of the day when he is given a clean cold bath. Finishing this, he is allowed to take food. From that day for 90 days continously he has to abstain from preparations oily, and those savouring of salt, chillies or tamarind. The simple unobjectionable food is pure cow's milk and rice with a little sugar. Any slight violation of the principles of the fast subjects the patient to serious sufferings, ending in death. This system is found to be too strict to follow for men of business and hence the Pasteur system of treatment is now taken to.

To the writer's knowledge there are two places in India where the Pasteur system of treatment is freely given. One is in Northern India and the other at Coonoor in Southern India. This system of treatment to take good effect seems to require a cold climate. There seems to be also a proposal to have an institute at Ceylon the climate of which seems to be suitable for the treatment.

The admission for treatment in Coonoor Pasteur Institute is free both to the rich and the poor, of all creeds and castes. The Institute is a purely Government Institute, working on public donations for the benefit of the public. The treatment consists in injecting some serum to the patients for 14 days continuously without any break and with two injections a day. In the preparation of this serum, the rabbits of European breed, play a great part and a continuous supply of them is secured through a contractor who is said to have a farm to rear them at Pondichery. The injection of serum is not very painful. Really there is a very little pain in the injected part for a little time till the serum is absorbed. It often takes a little time and when the absorption takes place a little scratching sensation is felt at the injected part. The patient is not then to scratch the part but to apply hot fomentation which quickening the absorption nullifies the pain and the scratching sensation. At the time of the injection the patient is to a certain extent to practise abstenauce which consists in avoiding indulgence in alcoholic drinks, sumptuous and luxuriant food, long wakefulness, and in other bad human weak tendencies which the patient is expected to know would be weakening his system for the moment.

Prior to his proceedure for treatment to the Pasteur Institute the patient is expected to take certain precautions which alone would entitle him for a treatment in the Institute. As soon as he is bitten by a dog he is to ascertain somehow whether it is mad or not. Many are the dogs that bite and that are not mad and hence do not develop rabies in the man bitten. There are certain causes for a dog getting mad. There are certain seasons in the year when dogs have a tendency to bite which leads to the development of the rabies. At other times the bites are not effective. The weather for dogs in Madras is considered to be between June and October. All dogs go mad at other times when being bitten by rabid animals. There are many sure signs of their having developed the rabies in consequence of that bite. They attack men unoffended. They are characterised by an unnatural tone in their barking. It is a popular saying that the rabid dog has a stright stiff tail, slender body reduced to a skeleton and an ugly face. The collection of foam in its mouth is a sure indication of its being rabid. The surest sign to indicate the rabid nature of the dog is its agonising death within 10 days after it bites a man. The patient is expected to thus watch the dog carefully and to ascertain its madness. If the dog is found to be alive after ten days, having developed no sure signs of rabies he is not to undergo any treatment, for, the dog is not a rabid one. On reaching the Institute queries are eagerly made as regards the circumstances under which the man had the bite and the result of his careful watch over the movements of the dog. Only after the query is made the institute starts treatment. Any delay exceeding ten days after the bite is viewed with serious apprehension.

To conclude, many are the facilities provided for the rich as well as the poor both private and in Govt. service to undergo this treatment without being in anyway deterred for the moment by pecuniary difficulties.

N. S. Iswaran,
Junior Student.

[The writer having been bitten in camp, underwent treatment at the Pasteur Institute in December 1918—Editor.]

Under Planting in Nilambur.

In an article by Mr. Umapathi Mudaliar under the heading of "Under Planting in Nilambur", he advocates the introduction of bamboos, as an under storey to Teak. (Last para Page 53, Vol. III No. 2 of M. F. C. Magazine).

To me the introduction of bamboos presents certain difficulties and I request the help of some one to aid me to surmount these. Is it to be introduced by sowing or dibbling in seeds or by planting rhizomes? The former is difficult, nay, impossible, as one could not be getting seeds of bamboos year by year to suit our requirements as bamboos are a species which flower and seed gregariously. With regard to the latter method of introduction I have to say that the bamboos introduced by means of rhizomes will flower and fruit at the same time as the parent clump from which the rhizomes have been removed. This statement of mine is very easily proved. We notice the culms coming out of the rhizomes taken from the parent clump and planted out is of the same size as the culms of the parent clump of the previous year or as big as the culms sent up by the parent clump in the very year. Probably the growth of a year may be retarded by the shock caused; but this will never go to put a year more in the life of the clump which had been singled out from the parent. It will flower and fruit along with the parent.

If the difficulty of the introduction of bamboos at Nilambur in plantation after plantation as an under-storey to teak be overcome we would have solved a difficulty which we may feel (hereafter) for want of stuff for making rafts for floating over teak down to Kallai, Calicut and other markets on the Coast. The Sylvicultural advantages are proved and varied. Summarized it is financially and culturally desirable.

A. B. FENN,
Forest Ranger,
North Coimbatore Dt.

19th Feb. '19.

Memecylon edule.

The importance of this small tree which occurs in almost all the dry forests of South India is not commonly known. The wood is of great value as fuel. The leaves dried and crushed into a powder are essential for dyeing cotton cloths with Alizarine dyes In certain districts the collection of these leaves is leased out.

In the Madura District the minor forest produce contractors collect the leaves very largely and the powdered stuff finds a ready market at Madura where dyeing is a cottage industry.

The leaves are collected all the year round but the best quality is available between December and June, leaves of all ages are useful and collected.

The ends of twigs are broken off and dried in the forest itself or in adjoining fields in prepared grounds. The leaves turn a golden yellow colour when dry and the woody portions are carefully picked off. It takes about 4 days for the leaves to thoroughly dry. The leaves are then crushed in a mill and bagged ready to export. It retains its qualities for 6 months deteriorating in value afterwards until at a year after collection when it is perfectly useless. Rain or dew spoils the leaves. Iron salts are apparently harmless as the leaves are very often dried in loamy soils where iron salts abound. It is essential that the picking and drying should be clean and the powdered stuff free from dirt and sand.

A maund of 25 lbs. costs Re. 0-6-0 to 0—8—0 for collecting drying and crushing the leaves and sells at Madura for 0—12—0 to Re. 1

The exact process of dyeing is laborious but not of forest importance.

Nattam,
6—2—1919.

T. G. SANKARAN NAIR.

A Six months' practical training.

It was on a bleak December night in 1916 that I caught the train at Hyderabad Station, bound for Kareemnagar, my home for the next six months, for I was proceeding on my 6 month's practical training, prior to joining the Madras Forest College at Coimbatore.

Early next morning I arrived at Kazipet, the nearest station to Kareemnagar and there found a large Motor bus of the Hyderabad Motor Service waiting to carry me to my destination. Arrived at Kareemnagar I was told that the D. F. O. was camping some 20 miles away. I started that same night for camp in a cart, and after a sleepless, bone-racking journey arrived, and reported myself. Kareemnagar is a moderate sized town situated on the left bank of the Maner a tributary of the Godavery. It is the head quarters of the D. F. O. and is one of the Major Districts of the Dominions.

The general outline of the country is level, rising here and there in rugged rock-bound hills with scanty tree growth, the home of the panther and the bear. The country thus stretches in alternating plain and hill to the banks of the Godavery the boundary, of Kareemnagar Division. The forest growth of this District is as is generally the case in all Districts, scanty except for an area bordering the banks of the Godavery where the best teak growth in the Dominions is found. Other valuable species found in these forests are Rose wood, Pterocarpus Marsupium, Satinwood, Diospyros melanoxylon, Terminalia tomentosa and some others.

These species are found growing more or less in conjunction with such species as Bombax, Sterculia Urens, Odina Wodier, Cassia fistua, and others. Tall toddy palms in the distance marks the site of some village and thither a cart track winds its way.

It was in such surroundings I found myself. I was soon initiated on the mysteries of surveying and found myself taking a survey of a small hill, covered with tree growth, the timber of which was to supply the neighbouring village with fuel and agricultural implements.

That little area was to be worked under the 'Coppice with Standards' method. The yearly requirements of the neighbouring village are first calculated, taking 2 lbs. of fuel per house per day. The yield per acre, less the standards, which are generally 25 per acre, is then found by actual experiment, and the number of acres required for the yearly supply of fuel to the village arrived at. This area is then marked out the Coupes allocated and working under the Coppice with standard method commenced. This method of working is known as Village Forest System. Thus the working of the forest throughout the District. Grazing is allowed in certain areas and for these privileges the villagers are required to help the forester in fire pretection works, Demarcation, as Survey coolies etc.

The minor forest produce collected in this District are Beedi leaves from Diospyros melanoxylon, which yield a large outturn of revenue, Honey, Wax, Cassia auriculata and C. fistula bark for tanning purposes, Mohwa (Bassia latifolia) flowers for distillation into the natives favourite beverage "Schrab" and other produce too numerous to mention.

The method of collecting the Mohwa flowers is as follows: In the month of March and April when the trees are in flower women and children go out early in the morning to collect the fallen flowers in baskets. These baskets they sell, the prices ranging from $\frac{1}{4}$ anna to $\frac{1}{2}$ anna per basket according to its size, to a Maistry Generally a personage from the nearest distillery, who has taken a contract of the trees in that particular village from Government.

In some convenient spot the ground is cleared and here these flowers are spread to dry. When quite dry they are carted to the distillery.

It was in 1917 that steps, towards, the propagation of lac, were taken in hand by the orders of the Inspector General of Forests, and I had the good fortune, to tie on many a stick lac to the juicy twigs of Butea frondosa. The fauna of this District are many and varied and often while lying in bed on a cold night have I heard the bark of a Sambur and the call of a chital (spotted deer) alternating with the snarl of a panther and the majestic roar of a tiger.

The ponds and tanks adjoining many a village afford the sportsman the pleasurable excitement of duck and teal shooting, while the cultivated fields standing under water with the tiny blades of the rice plant rising above, afford a just sufficient cover for snipe.

It is thus with pleasure I recall the happy time I spent in the first and only District of the Nizam's Dominions to which the order of the Inspector General of Forest sent me to.

G. M. Edwards,
Senior Student.

1st May 1919.

"Talk" of Elephants.

On reading the article in the Madras Forest College Magazine about the talk of elephants I got the same inspiration (I know not how, probably from the writer of the previous article) when I had a chance to go to an elephent camp where there were two new captures who were talking to each other (talk, I mean by making signs which no one can understand except myself and the one from whom I got the inspiration). The talk in a very interesting one the purport of which is given below. Of the two elephants one was a female and another a young tusker.

Female— My dear comrade in bondage, those junglers (Forest officers of the Range establishment) are very glad at our capture because they get a paltry few rupees, reward. I think they must be doing so at every time our tribes man falls in their power and they don't realise the serious blunder they are committing.

Tusker— What is that blunder? They are making a profit of thousands of rupees on every one of us and they must have hoarded a good lot of money up to this by capturing a good number of us.

Female— My dear comrade, you quite understand that they captured a good number of us since a very long time and that is why I say that they are committing a serious blunder.

Tusker— What is that blunder then?

Female— Tarry a while; I am now explaining what you have asked:— We dont' feel ourselves quite at home here though we are treated here kindly and given to eat things which we taste very rarely (*i. e.* by damaging paddy, ragi crops, plantain gardens etc.); but all these things are not at all conducive to our robust health. We can never live here long, not even half the period which we would live in Nature's Home (Forest) because you see that we are not in bondage there, and we can roam about leisurely as we like and eat the choicest and best fodder and that in varieties which would never bring us indigestion and such kind of fodder these people will never be able to supply us. The net result is that we go down in condition daily and lose half the strength which Nature had kindly endowed on us. Further being in bondage we can't multiply ourselves. Do you understand me?

Tusker—Oh yes! you have come to the point. I feel I have not even half the strength now though I can boast of being in the prime of life and you are quite right in saying that we can't multiply ourselves at all (under charge of Humans).

Female—Don't be inaccurate in your statements & don't condemn the Humans & especially so the jungles. We can multiply ourselves when we are in charge of Humans but to a very limited extent. There may be a few solitary instances of new-born young ones among us (when under charge of Humans) but this number is quite insignificant in comparison with the number they capture every year and the number that die in doing so. So our tribe will diminish and in course of time our race will be wiped off the face of the earth; did you not see that we had only a few comrades to walk about in our company of late whereas we used to have hundreds of our race some time back. By this the Humans will have to suffer very much.

Tusker— Why should they suffer? They had already made up as much money as they could and they don't care whether we die or live after we are sold.

Female— Don't be hasty in drawing conclusions. Did you not hear from our comrade (kumki elephant) who is already a friend of Humans that we are made to drag logs from these forests which they can't do by any other means. That is why they are so much in need of us and that is why I say, that our tribe vanishes which is not far off.

They will have to mourn our loss in sack cloth and ashes. Irretrievable blunder; but alas! repentance will come but too late, but still it is not too late to mend. They can even now make amends for their folly. Instead of becoming avaricious and capturing us in great numbers every year in pits or in Keddahs, they (forest officers) can capture a few of us as occasion arises every year just for the sake of their work (Forest Dept). Look at the damage done among us when we are caught in Keddahs because more than half among those caught die fighting for liberty.

Tusker— Humans are very wise. They will devise some other means to do their work after we disappear. These means may be by force of power or steam engine or electricity.

Female:— As you say they may device means because they are wise but by those means they will never be able to get the work done (what we do for them so very cheap). Even if they have wonderful means I think from what I hear they can't dispense with us altogether because those wonderful contrivances they can't bring to our regions and every part of it (Forests) and even if they do it will never pay them and what is most important there must be at the beginning a very big outlay which these humans are not prepared to lay out.

I do impress on you, my dear comrade, in bondage that you might have heard from our ancestors that we were used to fight for men and they used to take us in thousands and how you are quite aware that there may be scarcely a hundred or two at our dear native home (Mysore). We call this still our dearest home though we are plundered there (by Keddah operations) May God give them (Humans) power to cover the loss that will be sustained by giving up capturing us on a very large scale and also inspiration to every one of them to understand what we talk. Let us talk, more about them next time. My word! there is one of the Humans who seems to have understood us and laughing heartily and I don't know what the consequence will be and he may take revenge on us.

Tusker – Don't be afraid. No harm will come to us because we have spoken the truth. Even if evil may come remember the saying "Out of evil cometh good".

"WISE TUSKER."

From the above talk I think capturing operations may not be carried out on such a large scale as is done now; they need be carried out on a very limited scale for fear of the tribe being extingushed in course of time.

"WISE TUSKER."

Extract from "POPULAR SCIENCE SIFTINGS" for 22nd October 1918.

"Flowers that Fertilise Themselves."

Cross Breeding Exceptions.

A frequent statement in biological work is that cross fertilisation is almost essential in order to prevent weakening and consequent deterioration of the species. Such a statement, however, it is pointed out in a 'Scientific American' paper, by Albert A. Hansen, is not always verified by facts. Many of our cultivated plants have long been vegetatively propagated; thereby the effects of fertilisation are eliminated with no apparent degeneration or deterioration. Also there are several plant species which are habitually parthenogenetic (producing seed without fertilisation), particularly the hawkweeds, *Hieracium* sp., and the Dandelions, *Taraxacum* sp., and have apparently retained all of their vigour, even though fertilisation has ceased altogether. Some of the finest animal breeds, as for instance, the Royal Coach Horses of Austria, have been maintained by close in-breeding.

Perhaps the greatest stumbling block to those who argue for the necessity of cross-pollination is presented by the plant phenomenon termed "cleistogamy." Many plants produce flowers which never open; hence self fertilisation is necessary. Such flowers are known as cleistogamous flowers. In fact instances have been reported, as in the Sage, *Salvia cleistogama*, where dependence for reproduction is placed entirely in these self-fertilising flowers. Often where plants produce both the ordinary and the cleistogamic flowers, the latter are by far the more productive, as is well illustrated in the wonderful violet, *Viola mirabilis*. The derivation of the word from the Greek *cleistos*, closed, and *gamos* marriage, is very suggestive.

Some of the facts concerning this type of self-ferlitisation are extremely interesting. Cleistogamous flowers are usually smaller than the normal ones, and practically always show either entire abortion or much stunted development of the petals. Since the petals are normally useful for the attraction of insects, the reason for their suppression in cleistogamous flowers in obvious.

Another characteristic of cleistogamy is the reduction in the number of pollen grains produced by each flower. Thus in Cut Grass, *Leersia oryzoides*, about fifty pollen grains are produced in each cleistogamous flower, as compared with over three million counted in the normal flower of the Peony. Since insect pollination is wasteful, the reason for the reduction of the number of pollen grains in cleistogamous flowers is apparent. Even the number of stamens may be reduced, as is illustrated in the Rockrose *Helianthemum canadense,* a plant possessing both normal and cleistogamous flowers In the former, the stamens are normally indefinitely numerous whereas in the latter they have been reduced to from three to ten.

Another phenomenon presented by cleistogamy is the frequent production of functioning pollen tubes from pollen grains which never leave the anthers, the latter remaining closed. This is further facilitated by weakened spots in the wall of the anther, frequently illustrated in the violets, through which the pollen tubes penetrate. The close association of the anthers and the stigmas in these unopened flowers readily explains the cause of this interesting phenomenon

Many forms of cleistogamous flowers are subterranean, as is illustrated in species of violets, Bitter Cress, *Cardamine chenopodifolia,* and the Milkwort, *Polygala polygama.* The advantage of such a situation are many. The seeds are practically planted on maturity, with little loss from the depredations of seed-eating animals. The pollen is also well protected from pollen eating insects and from the loss occasioned by wind and rain.

The conditions leading to cleistogamy are many and varied. On the Balsams, *Impatiens,* sp., the presence of a fungus has induced cleistogamy and the same effect has been observed on *Biscutella* when attacked by certain parasitic insects. Nutrition seems to be another factor, as indicated by the fact the Touch-me-not, *Impatiens noli tangere,* which ordinarily produced both open and closed flowers, will produce only the latter when the plant is transferred to a habitat affording but poor nutrition, as for instance in sand.

The sun also exerts its influence. Certain species of violets when grown in the shade will produce only cleistogamous flowers, but when transferred to a sunny environment will produce petaloid flowers in abundance.

Perhaps the strongest factor to influence cleistogamy, however, is temperature. A cool temperature seems to induce the production of the self-fertilizing type of flower, whereas a warmer temperature seems to influence the forming of the petaloid flowers. Thus species which are ordinarily cleistogamous in England become normally of the open-flowered type in Italy. The temperature factor is well suggested in the Dead Nettle, *Lamium amplexicaule*, which is cleistogamous during the cool spring and autumn, but which becomes chasmogamous (of the petaloid flower type) during summer.

A situation similar to cleistogamy is presented by many species, particularly in flowers of mountain habitat when continuous rainfall during the period of floral maturity drives away the pollinating insects. Such flowers frequently fail even to open under such conditions but successfully mature seed through the agency of self-fertilization.

A wider knowledge of the facts related to cleistogamy may possibly have influence on experimental genetics. The phenomenon at least suggests that the necessity of cross-pollination has in past been too strongly emphasised. In the light of our present knowledge it may be stated that for some plants and animals cross fertilisation is beneficial, while for others self-fertilisation is preferable.

E. M. C.

Extract from 'The Pioneer.'

THE ASSAM FORESTS.

The year ending the 30th June 1918 was a particularly difficult one for the Assam Forest Department, for not only were nearly three-quarters of the Imperial officers away on military service, but restricted expenditure and a general depression on the timber trade also adversely affected the administration of the department. Yet it continued to do good work and the wonder is not that progress was retarded but that officers remaining were able to carry on as well as they did.

* * * * * * * *

This lack of cohesion is not peculiar to the Assam forest report; we have noticed the same thing in the reports of other provinces where there are more than one Conservator, and we venture to suggest that, in the absence of a chief Conservator, the senior Conservator should be made ressonsible for the report, and should deal not with each circle separately but with the forests of the province as a whole. In this way we should be given not only a more readable report, but one which would be of far greater value to the world at large.

There is little question that Assam possesses in its forests an asset of enormous potential value, for the total area of forests, amounting to over 22,000 square miles, is roughly 45 per cent of the whole province, and there can be no doubt that a great deal of this area is capable of being much more profitably worked than it is at present. Of the total area of forest land only some 5,000 square miles, is roughly 45 per cent of the whole province, and there can be no doubt that a great deal of this area is capable of being much more profitably worked than it is at present. Of the total area of forest land only some 5,000 square miles have been reserved, the remainder, which forms by far the greater part, being unclassed. Much of the latter is undoubtedly doomed to destruction, for every year unregulated *jhuming*, that is temporary cultivation, causes enormous damage both in the hills and in the plains. During the year covered by the report attempts were made, especially in the Darrang division, to check the extensive destruction of valuable tree forests by squatters, but the Conservator of the Eastern Circle has to admit that it appears doubtful whether much can be done without further legislation. In some cases, particularly in the more accessible forests, reservation is necessary in the interests of the people themselves, in order to insure their future domestic requirements, but although the importance of this is fully realised, little progress has so far been made in this direction owing to the difficulty of finding suitably situated areas of sufficient extent.

It is becoming more and more the policy of Government to hand over to local management, usually subject to the control of the revenue authorities forests which are of little use except to provide fuel and pasture to the village communities. In this way the Forest Department is relieved of the control of areas from which it derives no benefit and it is hoped that the villagers will take more pains to protect the forests in which they have a direct interest. The policy is being steadily persevered with in parts of the Punjab, and in Assam a very similar experiment is now being tried. A number of blocks of jungle, situated in the vicinity of villages and suitable for the supply of fuel and other petty forest produce, were selected in the

Sibsagar district, and rules having been issued for their management, they were handed over to the control of local committees. The results of this experiment will be watched with interest.

Probably the most serious aspect of the retarded progress caused by the absence of so many of the superior establishment was the delay it involved in the preparation of working plans. At present only 20 per cent of the reserves are under regular management and working plans are required for no less than 2,000 square miles of forest. It is to be hoped, therefore, that when the cadre of the department is again brought up to full strength this work will be pushed on without delay, for on nothing does the future of the forests depend so much as on the preparation of working plans and the introduction of scientific systems of management. The problem of regenerating the *sal* forests both of Assam and Bengal, has, however, been engaging the attention of Forest Officers for many years, and it is a problem which will probably entail much more laborious investigation before it can be said to have been solved. But its importance cannot be minimised, for the forests of the Duars are are some of the most valuable tree-bearing lands in India. Almost flat and extremely fertile, much of this area is capable of producing *sal* of the highest quality. Yet under the old methods of treatment it is recognised that this species is almost certain ultimately to disappear. From this it must not be imagined that Forest Officers of a generation ago were responsible for introducing a faulty system of management. At the outset it was necessary first to adopt a system of management which would bring the forests into a more suitable condition for the introduction of more scientific forms of treatment. There can be no question that past treatment has greatly benefited both the growth and development of the *sal* which stood on the ground when that treatment commenced, but it also cannot be denied that it has very largely failed to give a new crop to replace the trees felled. It is obvious, therefore, that something more is now necessary and that the time has come when, if the productivity of the soil is to be utilised to as full an extent as possible, more intensive methods of management must be adopted. The forests of the Duars were visited both by the Inspector General of Forests and the Silviculturist in 1915 and as a result of their inspection the conclusion was arrived at that the treatment most likely to give successful results in the future would be to clear, fell and then to restock artifically in conjunction with field crops. This system has not yet been introduced on a large scale in Assam, though it will doubtless find a place in the new working plans. During the year under report several experiments were made to raise a crop of *sal* in conjunction with *jhuming*, but the results so far have not been altogether a success. This was largely due to lack of proper supervision; where this was adequate the results were more promising, and in this we may perhaps find the keynote to all silvicultural work in India. Regeneration, be it artificial or natural, is largely, as one Forest Officer expressed it, a matter of "master's eye" and one thing is certain, namely that without constant care and attention no system is going to give satisfactory results. There has hitherto been far too great a tendency on the part of Forest Officers in India to leave the restocking of their forests entirely to nature, and when she has failed to help, to throw the blame on the system of management. This tendency is now fast disappearing as it is being realised that regeneration, on which, needless to say, the whole future of our forests depends, cannot be obtained without a great deal of time and labour being devoted to careful and continued tending after the fellings have been made.

A few of the lessons learnt in the Madras Forest College.

Diverse are the lessons that we, the students, learn in this College in addition to the practical training given to us. It is my purpose here to give two of them, not that they are the chief ones, but because they struck me during our last camp at Sadivayal. The first one is the illimitable power of mind over matter. Mind, I here understand as will. It cannot be easily defined like many other combined mental faculties. It is a mode of motion of the intellectual faculties. It is a mental power of choosing and by which we determine something to do. A strong will is one's ability to carry wishes into practice and a weak will shows a flabbiness of purpose, indecision &c. The will with the Madras Forest College student is the power of carrying out the orders given to him and completing the work laid down in the programme within the specified time. I may cite here a few examples. During our camp at Nedungayam (South Malabar) we were asked to complete the formation of a new road within a fixed time. On the evening of that date, about 4 hours of work was still remaining. The Students went out with lanterns for work and fortunately it was a full-moon night and we were helped a great deal. The work was completed by mid-night and to the great satisfaction of our Instructor, he saw the work completed on the next morning. Again, at the Sadivayal Camp it was proposed to uproot a large tree (An Albizzia) about 3′ in girth by a 'Monkey-Jack' whose capacity was only 5 tons. It was not very fair to extract such a large tree with the Jack of low capacity. Still, the work was started and there was no going back, down must the tree come. On the 1st day the tree was tilted a bit and it was loathe to give way before the Jack. But there was the 'will' at the back of the 'Monkey-Jack' and on the second day in spite of the resistance offered by the tree, down it fell. This was a great lesson to us. Technically we learnt how to use a Monkey-Jack and that it was a very useful machine and that it was worth-while introducing it in our ranges should an occasion rise for it. The second and the greatest lesson was that some works would give us trouble but we should exert our will and must carry out our purpose and that if we only tried it heartily, success is surely ours.

The second of the great lessons, which I would point out is 'Dignity of labour.' In the College, we do a lot of work which to the outsiders may seem not very useful. We ourselves form roads, do the digging and filling in of earth. Almost every work that is started by us is finished by us. Technically we learn how much work can be turned out in a fixed time, the nature of the work and so on. But this is not much. There is dignity in work. Passers-by look on, when we carry the earth in baskets and form roads. They look surprisingly at us and at our khaki uniforms and we in turn, look at them with dignity with the satisfaction that we are doing our duty. "Blessed is the man that hath found his work." The Students are happy in their work and have learnt to earn their bread "in the sweat of thy brow." It is only the shallow minded men that esteem labour as a curse. The love of idleness is characteristic of the unenlightened and we are taught to love labour, to honour and appreciate it. We now consider that labour is a necessity and a blessing. It develops our physical and mental powers and gives a clue to our superiors as to our ability and competency.

One great advantage here, is that our desires *i. e.* what we should do, are weighed and judged by more experienced men and we are trained to express our will in carrying them out. Such great mental powers, where could we have learnt and in such a practical way? Any number of lectures in halls would not have taught us a fraction of it. Everything here is practical and we are made better practical men and worthy citizens even after our service in Government.

M. UMAPATI,
Asst. Editor.
5—5—19.

A brief note on Hyderabad forests.

The forests of Hyderabad in general represent a varied growth, ranging from compact high forest, as may be seen along the bank of River Godavery, to scattered patchcs of growth varying in densities, inlaid or bordered by other tracts diversifying in extent and which sometimes bear an identity to a vulture's neck, with regard to their bareness, being deprived of all the growth on them, grazed by fire and over grazed by cattle, these tracts seem to revenge for their loss, not only by destroying valuable buildings but also invaluable lives in thousands. The great Mcosi flood which occured in Hyderabad city on 28th September 1908 bears witness to this effect. The type of forest that is generally met with in the Nizam's Dominions is very similar to the growth seen in Walayar Revenue of the Central Coimbatore Division consisting of more or less the same species which, are divided into two main classes, namely Irsalee and Ghairee, meaning classified and unclassified respectively.

Amongst the Irsalee species are the Teku (Tectona Grandis) Bilgw (Chloroxylon Swietenia) yeppa (Hardwickia binata) Peddayeggei (Pterocarpus Marsupium) Abnas (Diospyros Ebenum) Nulla

Muddi (Terminalia tomentosa) Dargu (Ougenia dalbergiodes) chinanje (Lagerstrœmia parviflora) Shishum (Dalbergia latifolia) chundun (Santalum album) and a few others.

The last two named are however rare, but the rest are found in fair abundance in localities, suitable for their respective growth, attaining a girth which varies from 2 to 12 feet and over. Yeppa and Pedda yegei in particular attain the large size mentioned above. The soil in these forests varies considerably both in physical and chemical properties and is generally hard with no trace of humus on it, thus presents a bed quite unsuited for germination of seeds, consequently the natural regeneration almost amounts to nil. As regards the artificial means, plantations of Teku, Pedda yegei and chundan have been started on an experimental scale in Warangal and Aurangabad Divisions.

The method of treatment under which some of the forests are being worked at present is coppice with standards. The annual coupe is disposed of in the very way as is generally done in Madras Presidency in cases of forests worked under the above method. Permanent, timber and fuel depots have been formed at railway stations, wherever it was possible and suitable.

There are also forest areas, for which working plans have not been prepared, and which can possibly be worked under selection method of the high forest system, after undergoing some suitable provisional treatment, which would not have been necessary, had these areas not been worked under permit system in past.

In order to safe gaurd and improve the existing condition of the forests, the village forest system is gradually being introduced.

Besides timber and fuel there are several products of economic importance on which considerable revenue is realized, the the chief being *beedi* leaves, myrabolams lac and flowers of God mahwa (Bassia latifolia.) *Beedi* leaves are collected entirely from root suckers of Tumki (Diospyros Melanoxylon), the right of collection is sold by public auction to contractors taluk war the time and the area within which the collection is to be made being specified. Each contractor then announces by means of tom-tom in his respective area, his right, and the payment that he would make to the villages, who collect beedi leaves and hand it over to the agent employed by the contractor whose duty is to go round the villages within his limit in a rotation as it were. The payment generally made is about 2 pies for a bundle of 100 beedie leaves or so. The same process applies to the collection of chebulic and Emblic myrabolams.

Collection of lac is but in its infancy and is being nursed departmentally.

Gul mahwa occurs in great abundance throughout the Telungana districts and is under the direct control of the Abkari Department. Flowers are collected in the months of April and May and are used for distillation of liquor and manufacture of acetone.

A single flower is said to produce as much as 1/10 of it weight of acetone.

The methods of collecting the above products, no doubt causes frequent forest fires & as such are very detrimental to the welfare of forests. Induk (Boswellia Serrata) presents a very good chance to be tapped for its valuable gum oleo-resin, and it would be worth while to try and develop this industry.

The game of Hyderabad forests, is so plentiful and varied, that it would require a separate article to be described in detail.

ABDUL HAMUDKHAN,
Student, (1917—19 Division)
Madras Forest College,
Camp Bandy Shola,
5—5—'19 *Coonoor.*

The experiences of a probationer.

After a lapse of nearly two years and a half it gives me great pleasure to recall to my memory the few incidents of my probationery period, the changes that have imperceptably come over me and the few facts that have come to my knowledge during that period when I was under practical training for six months prior to my being sent to the Madras Forest College.

It was in the early part of January 1917 that I emerged out of the Central College and the busy bustle of a city life into the depths of Forests of Mysore District. I had but a poor idea of the nature of our training and the life that I am to lead. The famous lines of many a poet of Nature were ringing in my ears when I entered the Forests and nothing but the charm of Nature could interest me for a time. The few days in the beginning of my new career, I think, I felt myself much elated by the prospect of a life, the path of which was strewn with pleasure. I had great joy in rambling through the Forests all day long and it was neither tiresome nor dis-agreeable. The absence of the usual courses of coffee, tea, breakfast etc was forgotten on account of the spell thrown by Nature. When I began to think of the amount of exercise that I daily gave to my body in these aimless wanderings I realised the fact that in this I was really training my body to with-stand a great amount of exersion and control hunger and thirst with ease.

The first lesson that I learnt from my instructor — to whom I owe much gratitude for the interest he took in moulding me for the training in the College — was to cultivate the power of observation. This faculty was to a great extent improved by the effort made to recognise the innumerable species found in the Forests. At first all was confusion but gradually the eye got accustomed to the task and I could with ease recognise the principal species of the forest. This development of 'The Forest eye' as our much beloved and esteemed Principal calls it has had its beginning during the probationery period and takes perhaps years to mature. The keen interest that is created in us in the College contributes a good deal to the development of 'The Forest eye'.

The next and most important training perhaps is the physical training. As I was under the instructor who was in charge of the V. T. School I had an opportunity to note the dignity of labour. The Foresters and Guards received a thorough practical training in the construction of roads, bridges, kilns and felling and extraction of timber. In every item of these I took part though at first I did not realise the importance of such a training. Few may think it below one's dignity to handle an axe, a mamti or a pick-axe but I am of opinion that a Forest Officer should himself be well versed in works which he is to supervise. No amount of theory would be of avail unless backed by the practical side of it. This idea of mine has been confirmed by the training in the College. After my training in Mysore during the probationery period I never blushed to be seen working with a mamti by any one. Here I might say that I took an active part in the construction of a Forest

Road, in building a wooden bridge, in the construction of a paraboloidal kiln, in felling and coppicing are acre of Forest and in opening a nursery. Though I had a great deal to learn, about the practical side of the work above enumerated, in the College the training that I had in Mysore has at least prepared me to undertake such duty as a matter of course.

The next item in my training I could think of is the descipline which is essential for one's own happiness and for carrying out the responsible work entrusted to us. Though there was no set rules for my conduct I soon realised that unless I desciplined myself properly and brought inclination under the control of will and the sense of duty I could never prove myself worthy of the responsibility and trust placed in our hands by the Government. It is a well known fact that descipline in the Madras Forest College plays an important part in the training. Leaving alone the fact that it produces capable Forest Officers it also moulds one's character, helps one to exercise perfect control over his passions and tends to make one's life smooth and happy. During the latter half of my probationery period I was placed under Mr. H. S. Narayana Rao, B. A., the then Working Plan Officer in Shimoga District to whom I owe much gratitude and love for the finishing touch be gave to my practical training. He gave me perfect lessons on all subjects dealt with before. Under him I was in charge of improvement felling in sample plots and had good practice in laying sample plots, measuring sample plots, communication surveys and such other works connected with the preperation of working plans.

By this time I realised the enormity of public good that the protection of Forests bestows. Forest Department is not so much for realisation of revenue as for the preservation of the whole country from denudations etc., preservation of the health of a locality, for a continued supply of water to streams and rivers, and, to keep up a continued supply of the necessary fuel and timber to the public. Besides it ever remains a paradise on earth where Nature reigns supreme.

To sum up the impressions that have taken deep root in my mind I might remark that I shall ever remain proud of my training these two years and a half, and of serving in a department which makes duty a pleasure and which gives me an opportunity to devote the best part of my life to public good.

C. L. NARAYANA RAO,
Mysore Student.
M. F. C.

A probationer's ideas about Mysore Forests.

Sandal has its home in Mysore and the best quality of Sandal wood is grown there. It is fairly distributed all over the Province but widely found in Shimoga and Kadur Districts. It is found growing on clayey, loamy and sandy soils and it is difficult to say in my limited knowledge where it grows best. It has for its associates Lantana, Zizyphus, Albizzia, Pterocarpus, Acacia intsia, Hymenodyction and numerous other species. It attains to a size of 7 to 8 feet in girth. Sandal seeds have been dibbed in various parts of the Province with varying successes but planting out sandal seedlings has not met with any success. About 12 or 13 years back sandal seeds were sown all round the compound of a Rest House having for its host an Acacia spp. and in April 1917 the trees measured from 6″ to 12″ in girth. Some had been suppressed by overhead branches of the host plants. The method working for Sandal is the same as that in vogue in Javadis.

The dead and dying trees are extracted. Before the starting of the Sandal distilleries in Mysore and Bangalore Sandal used to be sent to the Continent. Now all the sandal extracted is sent to the two centres Mysore and Bangalore. A small quantity is consumed by the people for caste mark and for worshipping God. A certain quantity is used for carving, for cures and dolls. In Sorab a taluq in Shimoga District a set of people who go by the name of "Gudigas" are very skilled in carving work and they live entirely by their skilled work.

The existence of Sandal is very seriously threatened by the 'spike decease' which is rapidly spreading. It is to be hoped that in the near future the efforts made by the Government to discover the cause of the disease and finding a remedy will meet with success. Sandal regeneration is in some parts poor on account of fire and excessive grazing. Sandal seems to withstand a certain amount of fire after it has reached a height of about 12 to 15 feet. Fire protection and limited grazing will surely tend to increase regeneration of sandal and add to the wealth of the Forests.

The best type of Forests are found in Mysore, Kadur and Shimoga Districts along the Western ghats. The most important Forests are Kakanakote, Lakkuvalli and Sukrebyle Forests. Giant teak trees were common in Mysore District but all those trees seem to have been cut under permit system. There are teak stumps of about 3 feet high measuring 28 to 32 feet in girth. Such living trees must indeed have been the pride of the Forests. On account of ill-treatment in the past the regeneration of teak has been endangered. Large areas are run over by bamboos and efforts are being made to clear the areas of bamboos and plant them with teak plantations have been started both in Kakanakote Forests and Sakrebyle Forests but they are yet young to draw any conclusion regarding their growth. Blanks in those Forests are utilised for dibbling teak seedlings.

Large sized Terminalia spp, Lagerstroemia, Dalbergia lalifolia and Pterocarpus Marsupium are of decidnous type. Near to the Western Ghats there are found evergreen Forests in which large sized Dalbergia latifolia, Hopea parviflora and other species are found. Only a few of these species are extracted on account of the enormous cost of transport and the difficulty for labour. Those Forests have to a great extent remain unworked. Government is encouraging people to inhabit such places and the Malnad Improvement Scheme has done great good in that line. Places where people would have been afraid of going and inhabiting have now been filled with men and many a new village have found their existence in the depth of Forests. Labour to those places will have to be imported. There is also a proposal to lay tramways through these Forests and when these schemes are successfully carried out the Forests as yet unworked will have a bright future.

Now the fire protection in Mysore Forests is very successful and only a very small area of Forests is burnt every year. This is mostly done by irresponsible villagers for getting early grass.

In Mysore District labour is very cheap. A set of hill tribes who go by the name of 'Kurubars' inhabit the Forests and they are very useful to the Department. They are a set of quiet- going harmless people. They sometimes subsist on roots and fruits available in the Forest and grow their corn in blanks. They know every inch of the Forest and serve as very good guides and are very useful in locating any game. They fearlessly live in a Forest where there are herds of elephants. They are excellent axemen and fell and dress timber quickly and nicely. The Department has given them certain concessions for which they are to work; of course, they will be paid at a fixed wages. Many guards and watchers are picked out of them and efforts are made to educate them and make them look on civilisation without fear.

In Shimoga District labour is dearer than in Mysore. Lambanis and Madigas are to be had in certain places. In other parts it is very hard to get labour. Near the western ghats labour is got from South Canara and Malabar but they do not permanently remain there. Thus to carry on Forest works becomes a matter of great difficulty. Concessions are shown to these men to colonise in such places and gradually they are settling down.

One of the activities of the Forest Department is Khedda operations. Forest officers play the most important part in this operation as they are better informed of the Forests and their inhabitants. The catching of the elephants is for the public good. Herds of elephants are found devastating the paddy and sugar cane fields of neighbouring villages and as a preventive measure Government spends a large amount of money to catch some of these herds. The herds are driven into barrickades constructed in suitable places. These are hobbled with the help of tamed elephants and after a time auctioned. The money spent in the operation will generally exceed that got by auctioning the captives. For a number of years after this operation the elephants that are not caught do not molest the people, perhaps on account of the fear created in them of having to share a similar fate as their friends.

C. L. NARAYANA RAO,

Mysore Student.

M. F. C.

Athletics side of the College.

The chief athletic events during this half year were the Marathon Race; the six-a-side foot-ball tournament, four foot-ball matches and one cricket match.

This year the Marathon Race was run as usual in Sadivayal on the 15th February 1919. This year's race is a noteworthy one for more than one reason. To begin with, all the 59 students of the college ran the race. In all previous years, a few had to be kept back being in the sick-list. Incidentally it may be said this is noteworthy considering the general unhealthy nature of the camp and as especially, this year the camp was placed under the application of certain special rule, making all the adjoining villages out of bounds and the getting of milk, vegetables &c from them out of order, due to the prevalence of cholera in them. That all students kept good health in spite of all these inconveniences is noteworthy. A detailed account of the race will be found elsewhere in this number.

SIX-A-SIDE TOURNAMENT IN FOOT-BALL.

As usual, the six-a-side tournament in foot-ball was played in Sadivayal camp; semi-finals and finals had to be played at Head quarters as the matches dragged on for a longer time than expected. Eight teams captained by students Seshagiri Rao, Narayana Rao, T. V. Thayuman, A Joseph, Muliyil, Vajravelu, Jurianz and J. D. Theodore were formed by selection of students for each team. In the semi-finals, the four teams that met were those captained by C. L. Narayana Rao and

A Joseph and Jurianz and Theodore, the rest of the teams having been defeated in the preliminary matches. The finals were contested by the teams of Narayana Rao and Theodore—the two winners in the semi-finals. These two teams had to meet twice, the first match ending in a draw. At the second match played on the 1st April, Narayana Rao's team won by 2 goals to nil.

The prizes of the year consisted of 1 thermos flask for the captain of the winning team and 5 fountain pens for the rest of the players in the winning team and one fountain pen for the Captain of the defeated team (consolation prize). The Donor — the Imperial instructor, being unable to be present, the prizes were given away by the Vice President of the Athletic Club. The winners were — 1. C. L. Narayana Rao, (Captain).
2. A. Rahimkhan.
3. K. G. Monnappah.
4. N. C. Mahadevan.
5. M. Umapathi.
6. T. D, Ponniah.

Captain of defeated team J. S. Theodore (consolation prize).

Matches. Four Matches at *football* were played during the month of March on the 4th, 18th, 20th and 27th respectively two against the Agricultural College, one on their grounds and the other on our grounds, and two against the Stanes' High School, one on our grounds and the other on their grounds. Of the Matches against the Agricultural College, the first was a draw by 3 goals to 3 and the second a defeat by 2 against 4 goals for them.

The two Stanes' Matches were won by us, the first by 2 goals to nil and the 2nd by 3 goals to one.

Cricket. On the 13th April, a match at Cricket was played by our College against 'Young Men's United Cricket Club, Coimbatore.' We had a defeat by 69 runs for us against 130 runs for the opposing team.

General. Badminton was played by students in all the camps of both the Divisions. At Head-quarters, Foot Ball, Tennis, and Badminton, were played, The Juniors had a swimming race in Mundanthurai, the first man being awarded a prize.

Students Vajravelu and Jurianz (both juniors) have been awarded colours in foot-ball during the team. Student Jurianz has been appointed Vice Captain for Foot-ball.

T. D. Ponniah,
Secretary & Treasurer,
Madras Forest College Athletic Club.

Coonoor,
4—5—19.

Students' Club.

As mentioned in the March number of the Magazine, the project for building a students' club or recreation room has been sanctioned by Government. A sum of Rs. 2000/- has been allotted for the purpose provided that a similar amount is raised by subscription. The building of the club will be carried out by the Principal.

After some months of delay the following information has been elicited as to the amount already promised or collected. Rs. 1109 has been promised by old students. Of this sum, Rs. 247—10—0 has been actually collected, and Rs. 140—1—0 has been spent for a purpose connected with the club. A sum of Rs. 107-9-0 consequently remains in hand.

Circulars are now being addressed to those who have promised but not yet paid the Rs. 1109 minus Rs. 247—10—0. A circular is also being issued to all others likely to be interested in the College, and to be willing to subscribe to this object, which will so materially contribute to the comfort and welfare of the students. It is proposed that all subscribers of Rs. 100/- and upwards shall be styled 'Patrons' and if desired their names will be shown on a tablet in the club. The Principal will be glad to receive subscriptions, the actual payment of which will be acknowledged in the pages of the Magazine as well as by letter.

Occasional Notes.

Mr. P. M. Lushington, Conservator of Forests, retired from the service on 18th November 1918 and then held the post of Deputy Controller of Timber supplies until February 28th, 1919.

As a member of the Board of Visitors, Mr. Lushington took a keen interest in the College, and on more than one occasion rendered valuable service by the weight of his personal influence and professional reputation. His advice and help will be greatly missed on the Board.

Mr. Lushington's retirement removes from the Madras Cadre the last of the Nancy-trained officers. His enthusiasm for sylviculture was but typical of the officers that came from that famous College, where, the training based on a familiarity with almost normal forests conduced to an inspiration, and to a realisation of the ideal, impossible in any Indian College.

* * *

The Silver Cup presented by Mr. Fischer for gymnastics has been received. It is a handsome specimen of the silversmith's craft.

* * *

On the 21st February 1919, the Senior Provincial Service class of the Dehra Dun Research Institute and College visited the Madras Forest College. The assistant instructor and students were accomodated in the first three blocks of the hostels. On the 22nd, accompanied by the instructor, Mr. Bourne, they were taken over the College and Museum by the Principal. On the same day Mr. P. M. Lushington late member of the Board of Visitors, and Mr. C. E. C. Cox (member of the Research Staff at Dehra) also paid a visit.

* * *

The Principal requests that if acknowledgements for contributions to the Museum do not reach the donors the matter may be brought to his notice.

* * *

Mr. S. Cox, Conservator of forests, and the Principal Forest College, were deputed to attend the recent meetings of the Board of Forestry at Dehra Dun. The Board sat from March 31st to April 8th, and dealt with a large variety of subjects including the triennial programme of the Forest Research Institute. For this purpose the conference was divided into Sub-committees; Mr. Cox served on the Sub-committee dealing with Working Plan Headings, and the Principal on the Sub-committee for the Economics, and Chemistry programme. On the subject of suggestions for future Forest Colleges, important resolutions were recorded.

The Proceedings of the Board will subsequently be published.

* * *

An excellent account, with illustrations, of the Burma Forest School will be found in the last Christmas number of the Rangoon Times which has been recently added to the Students' Library.

* * *

We are glad to learn that Mr. J. A. P. D'Cruz, 1913-15 Student now holds the appointment of "Forest Assistant to the Agent, Balliguda" on a pay of Rs. 150 per mensem. The appointment is a temporary non-gazetted one sanctioned for 1 year from 1-10-18.

* * *

It is with regret that we say good bye to Mr. and Mrs. McCarthy who have left for England with the intention, we understand, of retiring. Mr. McCarthy has always taken a keen interest in the Athletic side of the College and has on several occasions generously presented prizes. To Mrs. McCarthy we are specially indebted for her unfailing courtesy in responding to the many calls upon her time, energy and convenience whereby the winners on Prize-day and Athletic sports have so often been rendered the happier and the prouder for the graceful charm and kindly felicitations with which she presented the trophies gained. Long shall we miss her.

* * *

The College warmly congratulates Mr. S. Cox upon his selection as the first Chief Conservator of Forests in the Madras Presidency.

Mr. Cox *ex officio* becomes President of the Board of visitors. Under his direction the department, and the College will now enter upon a new era, in which a speedy development of professional skill and energy may be anticipated.

Mr. Cox is the youngest chief conservator in India as well as the most junior in length of service.

* * *

Owing to the kindness of Mr. Butcher Vols. II and III of the Indian Forester have been added to the General Library which now contains a complete set from the commencement of the Magazine.

* * *

The Government of Bengal propose to lease to the India Paper Pulp Co. Ltd. the right to extract for 21 years, bamboos for the manufacture of Paper pulp from the Kesalong Forest Reserve in the Chittagong Hill Tracts Division on certain concession rates.

* * *

On the recommendation of the Vice President, Athletic club, M. P. Subbayya is awarded his colours for Tennis and is nominated Vice Captain.

C. Vajravelu has been awarded colours for foot-ball.

* * *

'One of the prizes of the Marathon race for 1919 was purchased out of the donation kindly presented by C. D. Mc Arthy Esq. Member of the Board of Visitors.

* * *

MARRIAGE.

BENNETT—CARMICHAEL—On the 4th March, 1919, at the Catholic Cathedral, Coimbatore, by the Rev. Father Perrin, Herbert Charless Bennett, Imperial Forest Service, third son of Mr. and Mrs. James Bennett, Elgin, Scotland, to Barré Grace, only daughter of the late Mr. C. D. J. Carmichael, D. I. G. of Police, Madras and of Mrs. Carmichael, Thornford, Sherborne, Dorset.

Miscellanea.

We translate the following from the '*Revue Des Eaux Et Forêts*':—

Quick Work: The armistice was signed on November 11th. On November 15th the Personel of the Civil administration for Alsace and Lorraine was appointed. On November 26th an Inspector-General of Forests and three conservators were posted to those provinces.

On November 17th General Mangin Commander-in-chief in Alsace and Lorraine, on his way to take over the command, halted at Nancy to lay a wreath on the monument erected in the court of the Forest School to the memory of those Forest officers who died during the Franco-Prussian War of 1870.

FRENCH FOREST SERVICE SUPERIOR ESTABLISHMENT.

		NO.	PAY.
Director-general	....	1	
Inspector generals	....	3	£ 440 — £ 520.
Conservators	....	32	£ 320 — £ 480.
Dy. Conservators	....	191	£ 220 — £ 280.
Asst. Conservators	....	188	£ 160 — £ 220.
Extra Dy. & extra asst. Conservators	....	143	£ 96 — £ 140.

* * *

Ochroma lagopus a West Indian Timber weighs 7 lbs. per cubic foot.

* * *

In the U. S. America there is one telephone to every nine persons.

* * *

During the War the French Forest Service has lost 100 officers.

* * *

Under the supervision of the Superintendent of Agriculture the manufacture of potash from the water hyacinth was recently undertaken at the Sonaimuri centre in the district of Noakhali as an experimental measure. People supplied the ash at a nominal price and about fifty-six maunds of potash in the form of crystals were obtained.

The value and importance of potash as a manure for jute and rice are explained to the people by the Superintendent of Agriculture.

The following are the additions to the Libraries.

STUDENTS' LIBRARY.

1. "Red Air Fighter" presented by F. L. C. Cowley-Brown Esquire.
2. "Treatment of British prisoners of war in Turkey" presented by F. L. C. Cowley-Brown, Esquire.
3. "Kanana Prahasanam" (a telugu drama) presented by C. E. C. Fischer, Esquire.
4. "The interests of India" presented by F. L. C. Cowley Brown, Esquire.

GENERAL LIBRARY.

1. French Forests and Forestry — Tunisia Algeria Corsica.
2. Sedition Committee 1918 Report.
3. My Mission to London 1912—1914.
4. Catalogue of the Museums of the Forest Research Institute Dehra Dun.
5. Catalogue of Timbers in the Madras Museum.
6. Forest Flora for the Punjab.
7. Working plan for the upper Thanngyin T. C.
8. Indian Forest Act.
9. Madras Treasury Manual.
10. Journal of the International Institute of Agriculture Rome 1915.
11. Administration Report of Forest Dept. Madras Presidency 1918.

12. Revised Catalogue of Economic Museum of F. R. I. and College Dehra.
13. Indian Forest Records Vol. VI part VI.
14. Proceedings of Govt. Bombay 1918 Sept.
15. Travancore Administration Report 1917.
16. Proceedings of Govt. Bombay 1918.
17. Progress report of the Forest R. Institute 17—18.
18. Progress Report of the Imperial Forest College Dehra 17—18.
19. Home Canning, and drying of vegetables and fruits.
20. Working plan for South Dangs Forests, Surat, Agency.
21. A note on some of the Ship building woods of Burma.
22. Indian Forest Records Vol 6 part V.
23. Report of the Indian Industrial Commission 16—18.
24. Fauna of British India, Rhynchota Vol. VII.
25. Rules re. selection, felling, classification etc. of Sandalwood.
26. Nizam's Dominions Administration Report.
27. Kiln drying of Lumber.
28. The Graphic Souvenir of the German Navy's Surrender.
29. Proceedings of Government of Bombay, November 1918.
30. Annual Report of the Woods and Forests Dept. 1917. W. Australia.
31. Indian Forest Records Vol. VII part 1.
32. Report on Public Instruction in Madras Presidency 17-18.
33. Report and working Scheme of the Nilambur Teak plantation.
34. Christmas number of Rangoon Times containing an illustrated account of the Burma Forest School.

---

* *Note*— Numbers 27, 28, and 34 are commended to the notice of Students.

Contributions to the Gass Forest Museum.

Serial No.	Contribution.	Contributor.
1	Two bark samples	M.R.Ry O. Venkatrama Ayyar R. O. Bapatla Range
2	15 ,, ,,	M.R.Ry. C. M. Narayanan R. O. Kollegal range.
3	Specimens of Cyperus pexastachys	Mr. R. E. Lemos, M.R. Hons R. O. Ambasamudram.
4	Section of a log of Cadaba trifoliata	Do.
5	An abnormal coppice shoot of Teak with leaves in whorls of three.	Do.
6	A model of a chenchu hut prepared by Muhammud M. Hussain Khan, R. O. Markapur	F. R. Madan Esq. D. F. O. East Kurnool.
7	Two long panels of Pterocarpus santalinus.	M. R. Ry. S. Chinnadorai Pillai R.O. Balapalli range.
8	Two long panels of Shorea Tumbaggaya.	M. R. Ry. T. Parameswaran Pillai R.O. Chitvel range.
9	Seven long, and five short, panels.	M.R.Ry. E. K. Krishnan avl. D. F. O. North Vellore.

Serial No.	Contribution.	Contributor.
10	Four long panels and samples of barks of the same.	M. R. Ry. A. G. Jesudasan Pillai R. O. Maumurghat Range.
11	Four sample barks	The Range officer Santavasal
12	Five „ „	M. R. Ry. B. Krishna Rao R. O. Venukonda Range.
13	Honey comb on Prickly pear found in Strip No. 28 of M. F. C. Demonstration Forest.	K. Appiah Student M. F. C. 1918—20 Division.
14	Two long panels of Gluta Travancorica	Mr. R.E. Lemos M. R. Hons R. O. Ambasamudram.
15	Three specimes of Vegetable pathology	M.R.Ry. K. A. Chengappah avl. D.F.O. West Vellore.

Advertisement.

The following numbers of the 'Indian Forester' are required for the *Students'* Library. The Principal will be glad to receive any that officers can spare:—

1. Volume 1, 2, and 3 for 1875—76, 1876—77, and 1877—78.
2. Volume 6 for 1880—81.
3. Volume 13 for 1887—February Number.
4. Volume 14 for 1888—January, February, March, April, and December numbers.

5. Volume 15, 16, for 1889, and 1890.

6. Volume 17 for 1891—August, September, October and November numbers.

7. Volume 18 for 1892.

8. Volume 19 for 1893—February number.

9. Volume 20 for 1894—January, February, March, July and August numbers.

10. Volume 21 for 1895.

11. Volume 24 for 1898—March and April numbers.

12. Volume 25 for 1899-April, May, June and August to December numbers.

13. Volume 26 for 1900—August number.

14. Volume 34 for the year 1908—July number.

15. Volume 36 for the year 1910—August number.

16. Volume 38 for the year 1912—January, March, October and December Nos.

17. Volume 39 for the year 1913-January, April, September and October Nos.

18. Volume 40 for the year 1914—June number.

19. Volume 41 for the year 1915—April and September numbers

20. Volume 42 for the year 1916—May, June, November and December numbers.

21. Volume 43 for the year 1917—January, February, April, November and December numbers.

NOTICE.

WANTED for the Library a copy (mounted if possible) of, the June 1916 College Group. Rs. 2—4—0 will be paid for it.

Madras Forest College, }
Coimbatore. }

F. L. C. COWLEY-BROWN,
Principal.

* * *

" A Prize allotted from the ' Indian Forester ' Fund will be awarded to the past student of the Madras Forest College who submits the best Essay (limited to 2000 words) on the following subject :

" Forest Guards, their recruitment and control : Corruption of lower Forest Subordinates and how to prevent it. "

No award will be made unless a satisfactory standard is reached.

The Essays should be clearly written or typed *on one side of the paper only* and must reach the Principal, Madras Forest College not later than 1st June 1919.

Each Essay must bear a Motto: the motto is also to be written on a sealed envelope containing the name of the competitor and a statement to the effect that the essay is his bona fide unaided work : the name of competitor *is not to be written on the Essay*."

Gazette Notifications.

JANUARY 21ST 1919.

M. R. Ry., T. N. Seshagiri Rao, Range Officer, Nellore Range will relieve acting Ranger P. K. Kuttappan Pillai in charge of Kavali Range.

Mr. C. Mahony Ranger, II grade, on return from military duty in posted to West Cuddapah district, to work under the orders of the D. F. O. in connexion with preparation of Working Plan.

M. R. Ry., K. Jayaram, Ag. Ranger, VI grade is transferred from North Vellore to Trichinopoly district for the charge of Musiri Range.

M. R. Ry., L. B. Krishnan Avl. Probationary E. A. C. is posted to the charge of Dharmapuri Range, North Salem.

JANUARY 28TH 1919.

The privilege leave for 15 days granted to M. R. Ry., M. R. Sundaram Ayyar Avl. D. F. O. North Cuddapah will be extended by one week.

M. R. Ry., A. Hanumantha Rao Avl. D. F. O. West Cuddapah will continue to be in additional charge of the N. Cuddapah division during the period of extension.

The privilege leave granted to Mr. D. A. Stracey E. A. C. is extended by eight days.

R. Srinivasa Rao, Dy. Ranger, I grade, South Malabar is appointed to act as Ranger, VI grade and posted to Uppinangadi Range, S. Malabar district.

FEBRUARY 11TH 1919.

Mr. M. C. Chandy, Extra Assistant Conservator of Forests is granted privilege leave from the 7th November 1918 to 1st February 1919.

M. R Ry. M. Panchapakesa Ayyar Avergal, D. F. O., South Arcot cum Tanjore is granted privilege leave for 72 days with effect from date of relief.

FEBRUARY 25TH 1919.

The Board sanctions the grant of privilege leave from 5th to **11th January** 1919 to Muhammed Abdul Karim Sahib Bahadur E. A. C. and Instructor of the Forest College, Coimbatore.

Mr. D. T. Barry, D. F. O. is granted privilege leave for one month from **23**rd April 1919 with permission to prefix the Easter Holidays.

The D. F. O. Madura, will be in additional charge of the Tinnevelly cum Ramnad Dn. during Mr. Barry's absence on leave.

M. R Ry. B. S. Ramaswamy Ayyar from VI grage, permanent to V grade *Sub-pro-tem*

The following promotions are made owing to the retirement of M. R. Ry., R. Sama Rao, Ranger III grade.

(1) Mr. M. Hussain Khan from III grade *sub-pro-tem* to III grade permanent.

(2) M. R. Ry., N. Sundaresa Ayyar, from IV grade permanent to III grade *sub-pro-tem.*

(3) Mr. T. T. Ansep, from IV grade, *sub-pro-tem* to IV grade permanent.

(4) M. R. Ry., C. G Ganapathi, from V grade permanent to IV grade *sub-pro-tem.*

(5) M. R. Ry., P. S. Varadakrishnama Acharya from V grade *sub-pro-tem* to V grade permanent.

(6) M. R. Ry., B. Sambamurti Ayyar from VI grade, permanent to V grade *sub-pro-tem.*

M. R. Ry., K. Tatachari, Ranger, V grade, on special duty in Kurnool West to Owk range, Kurnool South.

MARCH 4TH 1919.

(1) M. R. Ry., A. K. Kandan, Ranger, V grade is transferred from S. Vellore to North Salem for the charge of Cauvery range.

(2) M. R. Ry., K. P. Krishna Ayyar, Ranger II grade is on relief by No. (1) posted to the charge of Krishnagiri Range.

B. T. Sitaraman, Dy., Ranger I grade, on relief by No. (2) is transferred to North Vellore Dn. for special duty in connexion with formotion of Forest Village System.

B. T. Sitaraman to act as Ranger VI grade vice Syed Edulla Sahib on leave.

S. F. Lobo, Dy. Ranger II grade to act as Ranger VI grade vice B. R. Salisbury.

(3) K. Parthasarathi Ayyangar, Ag. Dy. Ranger, I grade, to act as Ranger, VI grade, vice L. R. Narayana Ayyar on leave up to 6th April 1919.

MARCH 11TH 1919.

The following men are corfirmed as Ranger, VI grade, with effect from 1st February 1919.

(1) A. Subramanya Ayyar, Kurnool South
(2) K. Tiruvenkata Achari, Kurnool West.
(3) B. Gulam Dustagir, Kurnool South.
(4) Mr. S. A. Dawson, Upper Godavari.

MARCH 18TH 1919.

Mr. H. C. Bennett, Deputy Conservator of Forests, is granted extension of privilege leave for ten days.

M. R. Ry., T. S. Narayanasawmi Chetti, Ranger, Kodur Range, South Cuddapah district on relief by M. R. Ry., C. S. Ramanatha Ayyar, Ranger V grade, is posted to Siddhout Range North Cuddapah Range.

M. R. Ry., A. Sidda Pillai, Ranger in charge of Sidhout Range on relief by No. (1) is posted to the charge of Palnad Range, Guntur district.

M. R. Ry., K. M. Gopala Achari, Ranger, Palnad Range, is granted privilege leave for six weeks.

M. R. Ry., L. R. Narayana Ayyar, Ranger, III grade, is on return from leave to do duty under Mr T. N. Hearsey, E. A. C. on special spike investigation duty, with headquarters at Denkanikota.

MARCH 25TH 1919.

The Governor in Council is pleased to sanction the transfer, for a period of three years of the services of M. R. Ry., V. Raman Menon Avergal to Foreign Service for employment as Conservator of Forests in Travancore.

M. R. Ry , K. A. Chengappa Avl , E. A. C. is granted privilege leave for 3 months from 23rd April 1919 with permission to prefix the Easter Holidays.

M. R. Ry., Rao Sahib K. R. Venkataramana Ayyar Avl , D. F. O. South Vellore, to be in charge of West Vellore Dn. in addition to his own duties from the 23rd April 1919 until relief by M. R. Ry., V. Subramanya Ayyar, Avl.

M. R. Ry., Subramanya Ayyar Avl. on reversion to British Service, to be D. F. O. West Vellore.

(1) M. R. Ry., S. Vasudeva Reddi, Ranger, I grade is posted to Chengleput Range.

M. R. Ry., K. G. Sundararaja Rao, *sub-pro-tem* Dy. Ranger, I grade, in charge of Chengleput Range, will on relief by No. (1) work under the orders of the Range Officer, Chingleput.

APRIL 1ST 1919.

Mr. H. Tireman, Dy. Conservator of Forests, now doing duty as chief Forest Officer Coorg, on reversion to this Presidency, to be D. F. O., South Mangalore.

Mr D. L. Sathe D. F. O. Nellore, to be D. F. O. Guntur.

Mr. F. R. Madan, D. F. O. West Kurnool, to be D. F. O. Nellore.

Mr. T. A. Whitehead, on return from military duty, to be D. F. O. West Kurnool.

The services of Mr. H. C. Bennett, Dy. Conservator of Forests, are placed at the disposal of the chief commissioner of Coorg.

Mr. T. L Chakko, Ranger III grade doing duty under E. A. C. on special spike investigation duty, is posted to Thammampati Range, S. Salem Dn.

M. R. Ry. K. Parthasarathi Iyyengar (M.R.H.) to act as Ranger VI grade, vice Ranger S. M. Srinivasagam Pillai, on other duty in connexion with hay operations and posted to S. Vellore Dn.

Mr. Syed Munaver, Ranger, VI grade is on return from privilege leave posted to the charge of Ambasamudram range, Tinnevelly District.

M. R. Ry. K. L. Govindakrishna Ayyar Ranger is transferred to Mammarghat Range, S. Malabar.

Mr. A. G. Jesudasan Pillai Ranger is transferred to Segur Range Nilgiri district.

APRIL 8TH, 1919.

M. R. Ry. E. V. Padmanabha Pillai Avl. D. F. O., Chittoor, to be D. F. O. Central Coimbatore, from or after 23rd April 1919.

Mr. C. C. Wilson, Deputy Conservator of Forests, on return from military duty to be D. F. O. Chittoor.

Muhammad Abdul Hafiz Sahib Bahadur, Extra Assistant Conservator of Forests and D. F. O., upper Godaveri is granted privilege leave for 26 days from 22nd March 1919.

Mr. F. A. Seager, D. F. O. lower Godavari, will hold charge of the upper Godavari Dn. in addition to his own, during Muhammad Abdul Hafiz Sahib Bahadur's absence on leave.

M. R. Ry. T. N. Seshagiri Rao Ranger, Nellore Range will hold charge temporarily of Rapur Range in addition to his own till the arrival of Ranger M. R. Ry. H. Thammayya from Gooty Range of Anantapur Dist.

Mr. P. M. Mathew (M. R. H.) Ag. Probationary Ranger, VI grade in charge of Sanipaya range, W. Cuddapah, is confirmed is his appointment with retrospective effect 8th January 1918.

APRIL 15TH 1919.

Mr. F. A. Seager, D. F. O. Lower Godaveri will hold charge of the Upper Godaveri division in addition to his own during Muhammad Abdul Hafiz Sahib Bahadur's absence on leave.

Muhammad Asadulla Ghatala Sahib Ranger V grade, Kurnool West is granted combined leave for three months with effect from date of relief.

THE MAGAZINE
OF THE
Madras Forest College.
Published Quarterly.

Subscriptions.

Subscriptions per annum Re. 1/- and an entrance donation of Rs. 2/- for students of the College.

Rangers and Deputy Rangers etc.,—same terms as students. Assistant and Extra Assistant Conservators—Entrance donation of Rs. 5/- and an annual subscription of Re. 1/-.

Other Officers—Entrance donation of Rs. 10/- and an annual subscription of Re. 1/-.

It is not intended that the Journal should be run at a profit, so that as our subscribers increase the Journal will be issued in a more attractive form. Illustrations, will then be possible.

It is the aim of the management to run the magazine for the Ranger-class (including Deputy Rangers) and mainly by their contributions. Correspondents are needed to supply suitable matter to maintain the magazine on these lines. We feel confident that this appeal will not go in vain. There must be a number of our readers who have something of interest to write on.

Obtainable from the Manager,
Madras Forest College Magazine,
Lawley Road, P. O., Coimbatore,
SOUTH INDIA.

Advertisement Rates.

The Magazine is expected to have a wide circulation among Forest Officers in the Madras Presidency. Such articles as are useful to them as camp equipments, books, mechanical appliances, transporting gear etc., etc, can be advertised with advantage through this medium.

The following is the Schedule of rates.

	Single Insertion.	Per annum.
For full page	Rs. 6.	Rs. 12.
Half page	Rs. 4.	Rs. 8.
Quarter page	Rs. 2 as. 8.	Rs. 5.

Preparation of blocks unless supplied by the advertiser, charged extra.

Charges are payable in advance; the advertisements are subject to the approval of the working committee before insertion.

All business communications should be addressed to:

The Manager, Madras Forest College Magazine.
Madras Forest College, Lawley Road, P. O.,
Coimbatore.

Literary communications should be addressed to:

The Editor, M. F. C. Magazine,
Madras Forest College, Lawley Road, P. O.,
Coimbatore.

All remittances may be made to:

The Treasurer, M. F. C. Magazine,
Madras Forest College, Lawley Road, P. O.,
Coimbatore.